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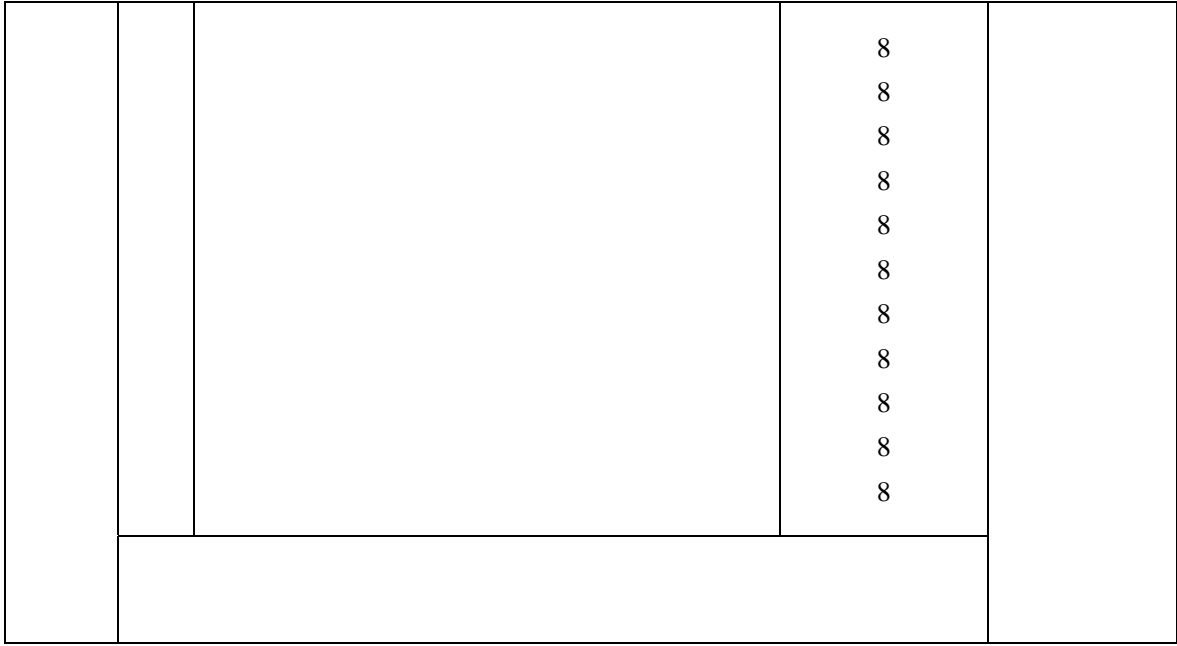
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Possible constraints on new parameters and standard
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- 51 2019 10
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G r a v i t a t i o n a l w a v e s f r o m p h a d i d i a l e Q s C o D r
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[1] A notn i o G o nrzrál y e z, a n k t a n ě m y o r i , K e n - I c h i I s h i k a w a , K a n a t

[5] T. Inagaki, H. Sakamoto, “Exponential integrability of the 29th Wilson Genevieve Conference in Japan 2019 [2019 11 27, 28]”

[6] * “Power-law modified gravity” JGRG 2019 11 25--26 ,

[7] Masahito Taniguchi, Tomohiro Inagaki, “Supernova modified Gauss-Boltzmann gravity” The Workshop on General Relativity in Japan (JGRG29), Kobe University 2019 11 25--29 [25-26 poster presentation]

[1] , , 2019 6 11 2019 6 11]

[2] , “Hints of new physics”, in The 5th Core-Use Seminar University of Tsukuba 2019 6 11] M

- [7] , , * Z e t a (S 2019), , 2019 9 11--13 [2019 9 11]
- [8] * R a n d a m d - S u m B r a n e - W o r l d i n M o d i f i e d G r a v i t y (S 2019), , 2019 9 11--13 [2019 9 12]
- [9] * , (S 2019), 2019 2019 9 11--13 [2019 9 12]
- [10] * (S 2019), 2019 2019 9 11--13 [2019 9 11]
- [11] _____ L e p t o n N u m b e r s i n U n i f i e d F r a m e w o r k (S 2019) 2019 2019 9 11--13 [2019 9 11]
- [12] * H i d d e n R i e d m a s i n t h e S e G a o d M i l a t i v e F r e e T e x t u r e S S I 2019 , 2019 9 11--13 [2019 9 11]
- [13] * b i l i n t h e d i l t h e V l o i k - e Q u a r k S 2019 , , 2019 9 11--13 [2019 9 11]
- [14] * M o d u l a r S v o r m o d e l i n S U (5) S S I 2019 , , 2019 9 11--13 [2019 9 12]
- [15] S U (2) H i g s S p h a l e r o n S S I 2019 , 2019 9 11--13 [2019 9 12]
- [16] S S I 2019 , , 2019 9 11--13 [2019 9 12]
- [17] , F (R) , S 2019 , , 2019 9 11--13 [2019 9 13]
- [18] , , * Z e t a k i n k N J L 2019 , 2019 9 17--20 2019 9 18
- [19] , , * , , M o d u l a r S v o r m o d e l i n S U (5) G U T 2019 , 2019 9 17--20 [2019 9 18]
- [20] , , * 2019 2019 9 17--20 [2019 9 19]
- [21] * , F (G) 2019 2019 9 17--20 [2019 9 20]
- [22] * , _____ , V e c t o r - e b s l 2019 , 2019 9 17--20 , [2019 9 17]

- [23] _____, _____, _____, * H i d d e n R e s l f a o r M a j o r a n a M a s s M a t r i x o f f o u r - z e r o T e x t u r e G e m e n s e t s i a o v d M i l t w a d i m a s s M a t r i x o f f o u r - z e r o T e x t u r e
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- [24] _____, _____, _____, 1
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- [25] _____, “ _____ F(R)
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- [26] T a k u y a M o r o z u m i, Y u t a K a w a m u r a, A p r i a d i a S T i d k i m n A a d g a a m, N a o y a T o l y o p a o n N u m b e r i V i a d U n a i f i e d F l a m e P h o y r s k i c s W o r k s
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- [27] _____, _____, _____, _____, M o d u l a r S t a b i l i z a t i o n i n F
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- [28] _____, _____, S U(3)
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- [29] _____, _____, _____, 4
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- [30] _____, _____, V e c t o r - l i k e s d, b s,
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- [31] _____, _____, T w o H i g g s
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- [32] _____, _____, _____, A p r i a d i m A a d a m, _____, _____,
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- [33] _____, _____, _____, _____, 2020 _____, _____, 2020 3 16--19 [2020 3 16]

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- [1] Y. Kioma and Y. Miura, “ The g n t e i o c w i t h s o f t a c h i c l a r i t y m i a n g a n f b i a e r l g d e ” s
P o g . o f T h e o r . a n 2 0 1 9 , 4 , p i . 0 4 3 E s 0 1 0
- [2] S. Kawamura et al (Y. K. O), j “ i S a p a e g i t o a n t a i l - w a v e a n t e n n a s D E C I
B - D E C I , G I O ” t o u n n a l o h f y (2 0 1 9) . D P 2 8 , i d . 1 8 4 5 0 0 1 .
- [3] Y. Akiyama et al, K. Y. Kao (J. O. I. M. 7 6 5 5) o r “ V i t o i m a i s o l a t i o n s y s t e m
a c o a n p t d r a g n p y s t e m f e o c r y n g d m i e o r K s A G R A ” s C s h a l Q u a n t . G r a v .
(2 0 1 9) 3 6 , i d . 0 9 5 0 1 5 .
- [4] T. Akutsu et al (Y. K. O) (G. M. 7 3 2 0 4), “ F i r s t c r y o g e n i c m o d t e s t
u n d e r g r o u n d e i g n a n t a i l - w a v e o K A G R A ” s C s h a l Q u a n t . G r a v . (2 0 1 9)
3 6 , i d . 5 0 0 8 .
- [5] T. Akutsu et al, K. Y. Kao (J. O. I. M. 1 5 5), “ T h e s t a A G R A o f K
u n d e r g r o u n d c r y o g e n i c g r a v i t a t i o n a l w (2 0 2 0) , 4 3 4 2 , e l e s c o p
i . 0 1 2 0 1 4 .
- [6] T. Akutsu et al, K. Y. Kao (J. O. I. M. 7 6 2 0 6) o r “ A n a r m l e i n z g a o t h i s t a b

system and fitted with a wide-angle camera. (2020) 37, id 035004.

- [7] M. S e r e n o , K. U m t e o t r s i u , D S . E c k e r t , F. G a s t a l d e h g a , P n , G N i . l e s , O k a b e , M. B i r k i n s h a w , a n d 6 o t h e r s , “ X X L S u r v e y g r o u p s a n d S u r . S c h a i g r t o i h a b e e t n w X - r o a p y e j r a d o a k l n g m s a i M N R A 4 9 2 , 4 5 2 8 - 4 5 4 5 (2 0 2 0)
- [8] K. U m e t s u e t a l . (N . O k a b e i s e t a k e - h e g r i a s n i f 2 5 y o s t i h s e o r f s t X e - R W a y - s e X X L G a y G r o u p s a n d C h l S u s t a e r u s M S 8 9 0 D 1 4 8 (2 0 2 0) , A p J
- [9] N . O t a i , t i s M i s h a i z , a k B a H . A k a m a n t h u e , , S . U c e h d i a , N . O k a b e , M . O g u F j i m o t o , T . H a m a n a , a n d 6 o t h e r s , “ X i s e s a C y A p r i d P A e c r l u i s e t s e o r f s h i H y p e r S u p r i m e - C a m S u b a r u , P A S J , 7 2 , 1 (2 0 2 0) P r o g r a m f i e l d ”
- [1 0] K. T a n a k a e t a l . (N . O k a b e i s t h e 1 5 t h o f 2 1 o t h e p r l s) , i f X - r a g r i a t o a n t a i l l e n s s y s t e m E y e i o f H M M - N s e w h o a 4 9 1 , M N R A 4 9 2 , (2 0 2 0)
- [1 1] H . A i h a r a e t a l . (N . O k a b e i s t h e 4 1 t e h a o f 6 4 f o t h u e p H s i) , p r e S r e S o n C a m S u b a r u S t r a t e g i d 4 R 2 0 1 0 g r a m ” , P A S J , 7 1 , 1
- [1 2] K. S e b e s i t l a l L a W s , n . b . o l r i g e s s E . M e d e z i n s k i , N . O k a b e , “ F r e r o a s t o r n u o f 1 2 7 4 e r o b u s s t u n f e c e t r i t e a s i a m g a n g i a s i n e h a n s i n g d a t a ” , 4 8 8 , 3 2 5 1 - 3 2 6 1 (2 0 1 9)
- [1 3] N . O k a b e , M . O k u m a , t h s u , A . H a m a b a w a , , A . M i d d z i o i n a s n k a i , , M . K H a y a s h i , T . O k a b e , S . U e d a , a o m d e 2 o n , h g a r l s a K a k e a t i c o d a n d g a s p r o t p i e r s p o t i i l l y d e f n i g n e d u n P e A r S g f i , 7 1 , 7 9 (2 0 1 9)
- [1 4] A . F a r a h i e t a l . (N . O k a b e i s e t c h t n i 1 2 f h n f t d 2 n o o t h h o l s a a n D i e c t o l b a r y o n s i n g a l a x y c l u c s a o t a i s , s l 0 , 2 5 0 4 (2 0 1 9) r e C o m m u n i
- [1 5] M i y a t a k e e t a l . (N . O k a b e i s t h e 4 0 t h o l f i 5 9 p a t h e o r s) o “ f W a e C a T k S u n y a e v - Z e l ' d o v i i t c h t y C p l e a h S u p s i w m e - C a , 8 7 5 6 3 (2 0 1 9) y ” , A p J

[1] N . O k a b e “ C l u s t e r s y o f G a l a x i e s : C o s m o l o g y ” (S S p S a I o) , e , S c i e n c e E n g 1 9 7 8 9 4 0 2 4 1 7 3 3 3

[1] N . O k a b e “ O v e r v i e w o f H S C - e R O S I T A - D E j m e n t g i 2 0 1 9 5 1 3 - 1 6 , M P E G e r m a n y

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[2] N . O k a b e “ S t a t X X L f i b h o i H S C - o i n t X X t n i g l , S O C 9 m e e l - 5 , O v r o n n i z t e , S l w a n d , 3 0

[3] N. Okabe “Update coefficients in the SrCs λ level system”, 2019, 7
1-5, Ovronnatz, Sw

- [1] _____ , 2019 7 26
[2] _____ , 2019 04 18 ,
[3] _____ ,
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- [1] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV*, Phys. Lett. B 803 (2020) 135225, Phys. Lett. B 803 (2020) 135225, 2020.
- [2] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1103/PhysRevC.101.034911, Phys. Rev. C 101 (2020) 034911, 2020.
- [3] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV*, 10.1103/PhysRevLett.124.092301, Phys. Rev. Lett. 124 (2020) 092301, 2020.
- [4] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP02(2020)077, JHEP 02 (2020) 077, 2020.
- [5] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP02(2020)077, JHEP 02 (2020) 077, 2020.
- [6] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1140/epj/s10052-020-7673-8, EPJ Phys. J. No. 267, 2020.
- [7] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP02(2020)077, JHEP 02 (2020) 077, 2020.
- [8] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1103/PhysRevLett.123.192301, Phys. Rev. Lett. 123 (2019) 192301, 2019.
- [9] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP12(2019)092, JHEP 12 (2019) 092, 2019.
- [10] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP03(2020)043, JHEP 03 (2020) 043, 2020.
- [11] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1140/epj/s10052-019-7389-9, EPJ Phys. J. No. 11, 896, 2019.
- [12] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP10(2019)108, JHEP 10 (2019) 108, 2019.
- [13] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP07(2019)134, JHEP 07 (2019) 134, 2019.
- [14] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1140/epj/s10052-019-7350-y, EPJ Phys. J. No. 10, 58, 2019.
- [15] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP09(2019)089, JHEP 09 (2019) 089, 2019.
- [16] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1103/PhysRevD.100.092004, Phys. Rev. D 100 (2019) 092004, 2019.
- [17] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP02(2020)077, JHEP 02 (2020) 077, 2020.
- [18] S. Acharya, K. S. H. Bhattacharya, *Measurement of the production cross-section of Λ baryons in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV*, 10.1007/JHEP02(2020)077, JHEP 02 (2020) 077, 2020.

- meosns in pncso $\bar{d} \equiv 7 \text{ TeV}$, $\nu 0:1007/ \text{JHEP} 08(2019)133$, $\text{JHEP} 08$, 2019.
- [19] S.Acharya, K. S h 'h' a k i, r e m e n t o f i J e s t i n P b o a r b p a r c o l f l i s i
2.76 TeV", 10.1016/j.physletb.2019.07.020, $\text{L} 07$, 204, 2019.
- [20] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
a C a s c a y d o e n t i b l a 08/ P h y s R t d 23. L I 2002, P h y s . R e v 2 L 23, 2002, 2019.
- [21] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
p e p h i e r a l P b o P b s c a t 1 = 5.02 TeV", 10.1016/j.physletb.2019.134926, $\text{P. h y s . L e t t. B} 7$, 9, 834926, 2019.
- [22] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
= 5.02 TeV", 10.1103/PhysRevC.100.024002, $\text{P. h y s . R e v. C} 100$, 024002, 2019.
- [23] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
f e m t o p s i c r o t o i n a d 0:1016/ j . p h y 2020. 135223, $\text{P h y s t L e t t. B} 235$, 223, 2020.
- [24] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
C o r r e l a t i o n s i n p p , p - P b , X e - X e , a n d o n P b - P b C o l l i s i o n s
10.1103/PhysRevLett.123.142301, $\text{P h y s . R e v. L e t t.} 123$, 142301, 2019.
- [25] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
c o l i n s s i a = 7 TeV, $\nu 0:1016/ \text{jphyl} 2019.05.028$, $\text{P h y s . L e t t. B} 719$, 28, 2019.
- [26] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
e x p e r i m e n t a l m e a s u r e m e n t o f t h e p h o t o n s p e c t r o m e t e r P H A S T
10.1088/1748-0221/14/05/P05025, $\text{J I N S T} 14$, 05, 05025, 2019.
- [27] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
a t = 5.02 TeV w i t h A L I C E", 10.1140/epjcs/10052-019-7893-6, $\text{E. P. J. C} 19$, 789, 2019.
- [28] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
c o l i n s s i a = 7 TeV, $\nu 0:1007/ \text{JHEP} 09(2019)108$, $\text{JHEP} 09$, 108, 2019.
- [29] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
L H C", 10.1016/j.compuhtys.2019.04.021, $\text{C o m p u t a t i o n a l P h y s . C} 2019$, 25, 2019.
- [30] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
c o l i n s s i a = 8.16 TeV", 10.1140/epjcs/10052-019-7893-6, $\text{E. P. J. C} 19$, 789, 2019.
- [31] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
10.1016/j.physletb.2019.04.046, $\text{P h y s . L e t t. B} 719$, 46, 2019.
- [32] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
i n l u r a p - p e r a l p h y s i c s = 5.02 TeV", 10.1140/epjcs/10052-019-6816-2, $\text{E. P. J. C} 19$, 681, 2019.
- [33] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
c o l i n s s i a t 5.02 TeV, $\nu 0:1016/ \text{jphyl} 2019.04.047$, $\text{P h y s . L e t t. B} 719$, 47, 2019.
- [34] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
= 2.76 TeV", 10.1103/PhysRevCh.99.064901, $\text{P h y s . R e v. C} 99$, 064901, 2019.
- [35] S.Acharya, K. S h 'h' i a k s i t i o n s o e f r t a n t a t i v a e o l t m i b e t w e e n n a d P r o t o n
c o r r e l a t i o n s i n p - P b a n d P b - P b a t t h e L H C", 10.1103/PhysRevC.100.0444903, 2019.
- [36] J. Adam, K. S h 'h' i g a k i,

- Single-Spin Asymmetry in the Production of Parity-Odd Hadrons at Forward Polarized $p+p$, $p+A$, and $d+d$ Collisions. *Phys. Rev. Lett.* **123**, 022301, 2019.
- [40] C. Aidala, K. Homa, K. Shigaki, Y. Yamaguchi, et al., “Measurement of the spin asymmetry in the production of parity-odd hadrons at forward rapidity in $p+p$ collisions at $\sqrt{s} = 200$ GeV. *Phys. Rev. Lett.* **123**, 092003, 2019.
- [41] C. Aidala, K. Homa, K. Shigaki, Y. Yamaguchi, et al., “Measurement of the spin asymmetry in the production of parity-odd hadrons at forward rapidity in $p+p$ collisions at $\sqrt{s} = 200$ GeV. *Phys. Rev. Lett.* **123**, 0944912, 2019.
- [42] C. Adare, K. Homa, K. Shigaki, Y. Yamaguchi, et al., “Measurement of the spin asymmetry in the production of parity-odd hadrons at forward rapidity in $p+p$ collisions at $\sqrt{s} = 200$ GeV. *Phys. Rev. Lett.* **123**, 022301, 2019.
- [43] C. Aidala, K. Homa, K. Shigaki, Y. Yamaguchi, et al., “Measurement of the spin asymmetry in the production of parity-odd hadrons at forward rapidity in $p+p$ collisions at $\sqrt{s} = 200$ GeV. *Phys. Rev. Lett.* **123**, 0944912, 2019.
- [44] C. Adare, K. Homa, K. Shigaki, Y. Yamaguchi, et al., “Measurement of the spin asymmetry in the production of parity-odd hadrons at forward rapidity in $p+p$ collisions at $\sqrt{s} = 200$ GeV. *Phys. Rev. Lett.* **123**, 054903, 2019.
- [45] T. Miyosho, K. Kano, and S. Inoue, “A magnetohydrodynamic model for the production of parity-odd hadrons at forward rapidity in $p+p$ collisions at $\sqrt{s} = 200$ GeV. *Phys. Rev. Lett.* **123**, 022301, 2019.
- [46] Y. Matsuyama, S. H. Lee, T. Kawanishi, J. Matsuyama, H. I. M. Tsai, S. Zenitani, T. Miyoshi, R. Matsumoto, “Measurement of the spin asymmetry in the production of parity-odd hadrons at forward rapidity in $p+p$ collisions at $\sqrt{s} = 200$ GeV. *Phys. Rev. Lett.* **123**, 022301, 2019.

- [1] K. Shigaki, “Experimental Aspects of the Production of Parity-Odd Hadrons at Forward Rapidities in $p+p$ Collisions at $\sqrt{s} = 200$ GeV. In: Proceedings of the International Symposium on Clustering and Spectroscopy of Quark and Hadron Systems (JHEP 2020.123-24)
- [2] K. Homa, “Production of parity-odd hadrons at forward rapidity in $p+p$ collisions at $\sqrt{s} = 200$ GeV. In: Proceedings of the International Symposium on Clustering and Spectroscopy of Quark and Hadron Systems (JHEP 2020.123-24)
- [3] K. Homa, “Simulated Radar Collisional Asymmetry in the Production of Parity-Odd Hadrons at Forward Rapidities in $p+p$ Collisions at $\sqrt{s} = 200$ GeV. In: Proceedings of the International Symposium on Clustering and Spectroscopy of Quark and Hadron Systems (JHEP 2020.123-24)
- [4] K. Homa, “Production of Parity-Odd Hadrons at Forward Rapidities in $p+p$ Collisions at $\sqrt{s} = 200$ GeV. In: Proceedings of the International Symposium on Clustering and Spectroscopy of Quark and Hadron Systems (JHEP 2020.123-24)
- [5] K. Homa, “Production of Parity-Odd Hadrons at Forward Rapidities in $p+p$ Collisions at $\sqrt{s} = 200$ GeV. In: Proceedings of the International Symposium on Clustering and Spectroscopy of Quark and Hadron Systems (JHEP 2020.123-24)

- [1] K. Homa, “Laboratory searches for pseudoscalar mesons in the production of parity-odd hadrons at forward rapidities in $p+p$ collisions at $\sqrt{s} = 200$ GeV. In: Proceedings of the International Symposium on Clustering and Spectroscopy of Quark and Hadron Systems (JHEP 2020.123-24)

- [1] K. Shigaki, “ALICE Forward Production of Parity-Odd Hadrons at $\sqrt{s} = 200$ GeV. In: Proceedings of the International Symposium on Clustering and Spectroscopy of Quark and Hadron Systems (JHEP 2020.123-24)

2019.5.8-10)

[2] Y. Yamaguchi, “ Activities of H i r o s h i m a N a t i o n a l G e n e r a l A L I C E M e e t i n g W o r k s h o p (H i r o s h i m a , J a p a n , 2 0 1 9 . 5 . 8 - 1 0) ”

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- [1] “ S t u d y o f t h r e e C b n s i n d i a r s M e y d i a n h H o n i u l G o s U s i n g F e m m a i R L a y T G a O b s e r v a t i o n s ” , M i z u n o T i a n S h i a , T . (5 t h) , a n d 5 c o a u t h o r s J r T h a e l A s t r 890, 120 (2020)
- [2] “ F e r m i a n d S w i f t n e s s i n t h e E v o l u t i o n o f s H i g h - e n e f r o m P r o m p t t o A f l o , e M i k h o w i s s A Y i M i z u n o , T . (7 6 t h) , P o o n , H . , (9 4 t h) 149 c o a u t h o e r A s h t y e s a i o J r , 890, 9 (2020)
- [3] “ B r i g h t a r a y F l a r e s O b s e r v e d i n A l j e o , C M R a z a w a 3 5 t Y i) (M i z u n o , T . (6 6 t h) P o o n 9 H t (h a n d 0 7 c o a u t h o e r A s t r o p h y s i c s 8 8 6 , 3 3 (2 0 1 9)
- [4] “ A c o n v o l u t i o n a l n e u r o n s i n t e r v e o p r o k i l a p r i m o f o r h a f e p a h t o r e i o c e l X - r a y o l a r i k i e g t a r t s , i M i z u n o , T n (8 1 7 h c) o a a , u N t I H M 6 4 2 , 3 6 2 3 8 9 (2 0 1 9)
- [5] “ F e r m i - L A T - R a y S t u d y M e n d i h G e m k a n t i e r R s a t y e s a i e o l n t M e e d G l h a m C o u d C o m p l e x : A L o o k a t t h e l e d y a T r h i G e k s H a I s . : ” M i z u n o , T . , 7 6 c o a u t h o e r A s p t h e y a s d i u J r , 8 8 4 , 1 3 0 (2 0 1 9)
- [6] “ A S a r c h f o r C o s m i c n R i a s y o i t r h o p h e v F e r m i L o o p e e ” A t j o e M . , F u k a z a w a Y . (3 5 t h) , M n i o z , T . (6 5 t a r h d 9 6 c o a u t h o e r A s p t h e y a s d i u J r , 8 8 3 , 3 3 (2 0 1 9)
- [7] “ M o n t e C a r l o s t u d i e s f o r t h e o p t i m i z a t i o n o f n A o c f h , a h y y C a h , e a r M i z u n o , T . (2 6 8 t h d) 4 6 8 c o a u t h o e r A t s l o t o r t a i r c h l y e s 8 8 1 k , 3 5 (2 0 1 9)
- [8] “ E s t i m a t i o n o f t h e n d e b y t h e d i f f a t a l g r o u s i n C e M t O n T i ” , R i p a , J , W e r n e r , N . (3 r n d o . M i (7 t u h) . F u k a l z t a h y) a T Y . k (a h a s h i , H . (1 2 t h) , a n d 1 6 c o A s t r o n o m i s c h 3 4 0 , 6 6 6 (2 0 1 9) i c h t e n
- [9] “ A D e c a d e o f R a a y B u r s t s y O f e s r e n r i v - E A t e : n t R G S a o t g a ” l A j e , M . , F u k a z a w a , Y . (3 9 t h o) , M i (7 2 t h) , P o o n , H . (9 1 t h) , a n d 1 1 9 c o a u t h o e r m s a , I I , h e A s 8 7 8 , 5 2 (2 0 1 9)
- [1 0] “ M A G I C h d F e r m i - L A T - r g a a y l r s u o n a s o c H A W e d s u c r e s ” , A h n e n , M . L F u k a z a w a , Y . (2 8 6 t h o) , M i (3 1 5 t h) , a n d 3 5 0 c o a u t h o r s , M o m t y h a l l y N o t i A s t r o m o l m S i o 4 8 5 , 3 5 6 (2 0 1 9)
- [1 1] “ E v e r e t - i s e n t h e f o r t h e m u l t i - l a y e a m S i b a C a n t d e H c n o i n ' p , O d m o , M . , F u k a z a w a Y . M i z u n o , T n d 2 7 c o a u t h o e r A r 9 2 4 , 3 2 7 (2 0 1 9)
- [1 2] “ P e r f o e r m a n d y o f l (a T I) a t r i g l i e h G a s t o r w i e t h o u n M P P G l a i n t o e s s a u t s e d t o l o h i z n e m g a a r b a y r s t s ” , T , F n a k z a w e a K n y d 0 2 M i z u n o , T . (4 t h) , T a k a h a s h i , l W e r n e (1 2 t h) , d 1 4 c o a u t h o e r A r 2 4 9 , 3 1 6 (2 0 1 9)
- [1 3] “ T h e A L M A D i s c o t v i e n g y D o i f s k h a e n R i o F t a a s t C e u t f l a r n G a o 6 7 6 i n l d M o l N a g H . i F u k a z a w a Y . (6 a t h) , d 1 3 c o a u t h o e r A r s l t y o d i u J r n a 1 9 3 8 (2 0 1 9)
- [1 4] “ e S p r o p l e p e r s o f g a m m a b r s a e y r b e d s k t y s w h i e d S - u b z a a n d a l l - s k y m o n i t o N , F u k a z a w a , Y n (9 1 t h) c o a u t h o t r i s q F s b l f i t h a e a A l s t o r o i n e o t h y 7 6 f J a p a n , (2 0 1 9)
- [1 5] “ X C L U M P Y : X - r a y a S l o m C l u m p y T o p r u l s i a c o n d t o t s h e C i r c i n u s C T a n i n A o , F u o k a z a w a Y . (5 a t h) , a n d 4 c o a u t h o p h e y a s d i u J r , 8 7 5 , 9 5 (2 0 1 9)
- [1 6] “ O b s e r v a t i o n s o f A p o n t F r i a t h w h e X - C a l i b u r H a r d X - R a y P o l a r i N I C E R , t h e S w i d f B t A X T R f n a d F e r m i G . M i k A h a 3 2 t h) , H a n d 2 9 c o a u t h o r s

The Astrophys J, 89, 70 (2020)

- [17] “Gravitational wave inspiral binaries, hot atmospheres seen by the totality of galaxies”, Lakshminarayanan, K. D. Weeramanjyot, No. 3, d. M. Anthology Notices Astronom Soc 488, L134 (2019)
- [18] “Powerful dust cooling in the Cerberus, Wron, and other regions. Q. and 14 co-authors, MNRAS, 481, 117 (2019)
- [19] “Optical emission lines from the W-Cube, R. Noeske, et al. S. (4th) and 11 co-authors, MNRAS, 481, 24382 (2019)
- [20] “Transit timing variations of small satellites, Z. et al., MNRAS (8th) and 6 co-authors, MNRAS, 481, 2019 (2019)
- [21] “Magnificent fields and extra objects in the X-ray galaxy clusters, Merriam-Webster (and 5 co-authors), Monthly Notices Royal Astronomical Soc, 486, 5430 (2019)
- [22] “X-ray spectra of the Fe-L complex”, Gu, L., Werner, D. M. (7th), and Astrophys J, 89, 15 (2020)
- [23] “Spectral features of the iron K α line in the X-ray spectra of the iron K α line, Z. et al., MNRAS, 481, 2019 (2019)
- [24] “Massive galaxy clusters in the X-ray and radio bands, Werner, D. M. (7th) and 11 co-authors, Monthly Notices Royal Astronomical Soc, 481, 2896 (2019)
- [25] “Clustering in the X-ray bands, Werner, D. M. (7th) and 11 co-authors, Monthly Notices Royal Astronomical Soc, 481, 2886 (2019)
- [26] “Elevated ionization in the X-ray spectra of the iron K α line, Masera, M. V., et al. (14th), MNRAS, 481, 2019 (2019)
- [27] “Evidence for planetary hydrogen in the X-ray spectra of the iron K α line, Tanaka, K. Y., et al. (7th), Kawabata, M. (16th), Publications of the Astronomical Society of Japan, 62, 19 (2020)
- [28] “Iron K α emission from the iron K α line, Uchiyama, M., et al. (4th), Kawabata, M. (16th), Publications of the Astronomical Society of Japan, 62, 4 (2020)
- [29] “An optical emission line from the iron K α line, Kawabata, M. (16th) and 38 co-authors, Publications of the Astronomical Society of Japan, 62, 72 (2020)
- [30] “Multi-wavelength observations of the iron K α line, Pasieka, M., et al. (23th), Kawabata, M. (16th), Publications of the Astronomical Society of Japan, 62, 492, 1295 (2020)
- [31] “A type Ia supernova at the heart of a supergalactic cluster, Kawabata, M. (16th) and 38 co-authors, Publications of the Astronomical Society of Japan, 62, 415 (2020)
- [32] “The ALMA spectroscopy of the
t i v e C O E m i s s i
with Power Spectral Density from 84 to GHz”, Uzgali, et al. (16th), Publications of the Astronomical Society of Japan, 62, 887, 37 (2019)
- [33] “New constraints on the flux density of the
t i v e C O E m i s s i
with Power Spectral Density from 84 to GHz”, Uzgali, et al. (16th), Publications of the Astronomical Society of Japan, 62, 887, 37 (2019)

major and minor components in MUSE deep fields, El d n ä nVi e H. (6 t h) gæuæds 9 c o
A s t r o n o m y & A, 631, 87 (2019) y s i c s

[34] “ Superhump § 24354.50+d24457.8:DF i r s t Z C a m u s p e a r h w m p s i t n i d l e ”, s t a n
A l t a, U M m u r a, M. (6 t h) § a o l l e a n g t u h e l s y M N o t i o c y e a s l a f s i n h o R o c i e t y,
489, 1451 (2019)

[35] “ On the ionization of the highly polarized Type I, In super
K a w a b a t a, K. S. (6 t h), Y a m a n a k a, M. (7 t h) § t s (10 t h), I K (8 t w h a), b N a t k a a M. (11 t
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[36] “ SN 2018 h n a : 1987 A u e p S r n b v h a w S i g n a t u r e o u f t S, h S o, i c A k i H r a A y a,
H. (15 t h), N a k a o k a, T. (16 t h), K a w a b a t a, M. (17 t h), K a w a b a t a 18 K. S. (18 t h),
c o l g e u a e f s h e A s h t y c s a i p u J r, 882, L 15 (2019)

[37] “ The A E M A s p s c o p i c S u r v e y i n t h e P t h y e s h i p D F E N a o t f u G a e s a n t a e s d s S e l
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[38] “ The A E M A s p s c o p i c H S u D r F v e o I n m o n t h y e n f c i o n s a n d c t u h l e a m o G l a s
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A s t r o p a l y J r i n a l, 882, 138 (2019)

[39] “ The A E M A s p s i c S u r v e y i n t h e P t h y e s h i p D F E N i o n e o f u t l h a e r M G o a l s i n
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882, 136 (2019)

[40] “ M o u l a n d g d s a t t p i r e o s p o e f r g a d m x e h a e s G O r b s e r v k y o L r I i R e G s S A u l r l v e y ”,
H e r r e r o R. I I n a a n m a i, H. (19 t h), l a l g e u a c 2 4 s c r o n o n y & A s t r, 628, 71 (2019) c s

[41] l e S q t p o o n l G a c r i y m a g t S O A r] a A] i e A M M g e a , e

- Horowitz Telescopes in G. I. Akiyama, K., Sasada, M. (1967), *The Astronomical Journal*, 875, L5 (2019)
- [50] “ First M87 Event Horizon Telescope Image of Sagittarius A* ”, Event Horizon Telescope in G. I. Akiyama, K., Sasada, M. (1968), *The Astronomical Journal*, 875, L4 (2019)
- [51] “ First M87 Event Horizon Telescope Image of Sagittarius A* ”, Event Horizon Telescope in G. I. Akiyama, K. (1968), *The Astrophysical Journal*, 875, L3 (2019)
- [52] “ First M87 Event Horizon Telescope Image of Sagittarius A* ”, Event Horizon Telescope in G. I. Akiyama, K. (1968), *The Astrophysical Journal*, 875, L2 (2019)
- [53] “ First M87 Event Horizon Telescope Image of Sagittarius A* ”, Event Horizon Telescope in G. I. Akiyama, K., Sasada, M. (1969), *The Astronomical Journal*, 875, L1 (2019)
- [54] “ Comparison of the First M87 Event Horizon Telescope Image of Sagittarius A* with the First M87 Event Horizon Telescope Image of Sagittarius A* ”, *The Astrophysical Journal*, 875, L47 (2019)
- [55] “ Cosmology from the First M87 Event Horizon Telescope Image of Sagittarius A* ”, *The Astrophysical Journal*, 875, L35 (2019)
- [56] “ The MUSE Atlas of the First M87 Event Horizon Telescope Image of Sagittarius A* ”, *The Astrophysical Journal*, 875, L48 (2019)
- [57] “ SN 2017z: A Rapidly Evolving Type I Ib Supernova Progenitor ”, *The Astrophysical Journal*, 875, 76 (2019)
- [58] “ Multi-wavelength Time-resolved Light Echoes from the First M87 Event Horizon Telescope Image of Sagittarius A* ”, *The Astrophysical Journal*, 875, 38 (2019)
- [59] “ Fermi Large Area Telescope Observation of Sagittarius A* ”, *The Astrophysical Journal*, 875, 33 (2020)
- [60] “ The magnetic field structure of Sagittarius A* ”, *The Astrophysical Journal*, 875, 5285 (2019)
- [61] “ The Antennae Galaxy M51: A Deep Field of Galaxies ”, *The Astrophysical Journal*, 875, 113 (2019)
- [62] “ First M87 Event Horizon Telescope Image of Sagittarius A* ”, *The Astrophysical Journal*, 875, L1 (2019)
- [63] “ First M87 Event Horizon Telescope Image of Sagittarius A* ”, *The Astrophysical Journal*, 875, L1 (2019)

- L e t, 875, L2 (2019)
- [64] “ F i r s t M87 E v e n t H o r i z o n I m a g i n g - S p e c t r o - P o l a r i m e t r y f o r T r a n s - P a r t i c l e s i n t h e E x t r e m e U n i v e r s e ”, M i n z o, T. *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [65] “ F i r s t M87 E v e n t H o r i z o n I m a g i n g - S p e c t r o - P o l a r i m e t r y f o r T r a n s - P a r t i c l e s i n t h e E x t r e m e U n i v e r s e ”, M i n z o, T. *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [66] “ F i r s t M87 E v e n t H o r i z o n I m a g i n g - S p e c t r o - P o l a r i m e t r y f o r T r a n s - P a r t i c l e s i n t h e E x t r e m e U n i v e r s e ”, M i n z o, T. *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [67] “ F i r s t M87 E v e n t H o r i z o n I m a g i n g - S p e c t r o - P o l a r i m e t r y f o r T r a n s - P a r t i c l e s i n t h e E x t r e m e U n i v e r s e ”, M i n z o, T. *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [68] “ T h e E v e n t H o r i z o n I m a g i n g - S p e c t r o - P o l a r i m e t r y f o r T r a n s - P a r t i c l e s i n t h e E x t r e m e U n i v e r s e ”, M i n z o, T. *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50

- [1] M i n z o, T., “ T h e E x t r e m e U n i v e r s e v i e w e d - i n - 2 0 1 9 ”, *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [2] H a e n I n a m i & A S P E C S t e a m, “ T h e A S M A S p e c t r o - P o l a r i m e t r y f o r T r a n s - P a r t i c l e s i n t h e E x t r e m e U n i v e r s e ”, *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [3] M i a t h o S a s a d a a l, “ A n o n - p a r t i c l e - p o l a r i m e t r y f o r T r a n s - P a r t i c l e s i n t h e E x t r e m e U n i v e r s e ”, *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [4] K a w a b a t a, K. S., “ T i m e - d e p e n d e n t I m a g i n g - S p e c t r o - P o l a r i m e t r y f o r T r a n s - P a r t i c l e s i n t h e E x t r e m e U n i v e r s e ”, *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50

- [1] Y u F a z a w a, “ X - r a y s t u d i e s o f 4 F G L f i e l d s i n t h e E x t r e m e U n i v e r s e ”, *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [2] Y. F u k u w a, “ J a p a n e s e C e a s t e r n A S M A S p e c t r o - P o l a r i m e t r y f o r T r a n s - P a r t i c l e s i n t h e E x t r e m e U n i v e r s e ”, *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [3] M i z u n o, T., “ T h e E x t r e m e U n i v e r s e v i e w e d - i n - 2 0 1 9 ”, *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50
- [4] M i n z o, T., “ S t u d y o f M B M 5 3 - 5 5 C l o u d s a n d P e g a s u s s u b s t r u c t u r e ”, *Journal of Astrophysics and Space Exploration*, 2019, 11(15), 50

- [5] Namio Uchida, "Rasidite tests of Shi-Beta for Hultree Sa
Misonis", SiPM wfor dunnlca pre e a a b h d u s i t r i a o n i s , p U p n i i v e o f
Ba, d i t 2019. y 0.2-4, 90
- [6] Fumaya fl m, "Oor pictgail nt o f X-s a i y e m p i f o r m d i a l r i i t a y b a n a l y s i s o f
gaxlya NGC 1275", E a t r a g R l y d L i e o g S a c y o f t h e T h i r d T C o a r m i b n r o i d g e
I t 2019. 9, 16-20, 100
- [7] Naoyoshi Hantga d e, p "A n t t o i n n d r a a n d a i g a e i n S i P M a e " t 2 o t d m t e m p o
I n t e o i n n a a l H i r o s h i m a S y m p o s i u m o n c t a n t e i D e v S e e l m o i p c n e n d t u a t
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- [8] Poon Helen, " I n t r o d u c t i o n t t o a X i - r H a i y r B o l l i j u m , a i n U e n y i r s y e P s o
s e m i n a r g h T u s a i U i n t i y v (B e g s i C j h i i 1 9 a 0 . 2 0 , 2 0 p e o p l e
- [9] Poon Hel etni, o i t t o r t o h e n G e i l W a i e t e c a t t B i r a o t j H i r o s h i m a U e n y i s v e r s
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- [33] _____ M C M C F S R Q S E D
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- [39] _____ V L T / M U S E
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- [40] _____ , W P 0 4 : O p t i c a l C o A l e a r l a s e r S P I C A / S M I
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- [41] _____ S P I C A ,
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- [42] _____ B e y o n d t h e O u i r s U b l i v e r f s r e a i r n e t h K I C O N N E X ,
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- [43] _____
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[2] T. S a k a m o t o u n g , I s t a n b u l , S z a w a (S O O C) G , 2 0 0 a m m a - r a y B u r s t s i n t
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[10] _____ _____ , I c e C b e l c h a t r i (o n) ,

[11] _____ , D r . D r . M a c H C o r c o r a n N A S A / G S F C , E t a C a r i n a e

[12] _____ , D r . N A S A , X C u b e S a t

[3] _____, “*Jesà Metzger (Chicago Univ. USA), Andrew Sdooong (MPH) (Stanford, USA)*”i, v

[4] _____, Ioannis Lioudas, Stanford University

[5] _____, Pankaj Kushwah, University of Sao Paulo, 2017

[6] _____, _____, _____, LIGO-Virgo Collaboration (California Institute of Technology, European Gravitational Wave Observatory) Stanford University

[7] _____, “*D. Sai, G. C. Anupama (India, Utkalya Assistant), Shashi Pan (India, Artya Padra)*”i, v
The Future of Observational-Science

[8] _____, _____, _____, Yab YUe, p U 4eje j, -] i 51 M

[5] _____		(B)	29-32	G e V		
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[5] _____		(A)	31-35	X		
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[6] _____			31-32	C A M E L O T		
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[8] _____						X L - C l a i b u r
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[9] _____		(B)	31-33			X
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[10] _____			31-32			
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[11] _____		(S)	31-35	X		
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[12] _____		(A)	30-32			
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[13] _____		(A)	27-31			
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- [1] M. S a i z d u m a n , T. T a k e i , S. Y a n a g i d a , N. K u a s n a W a k H a D a , S. M. H. K A z u m a , C. M o o s r h i j . K u n d Y i v a l , “ T h e r m a l S y n t h e s i s o f P y r o c h l o r i d e B i s m u t h B a s e d S u p e r c o n d u c t o r ” , I n o r g C h e m (2019) 1759-1763.
- [2] Y. G o t o , A. M i u r a , C. M o r i y o s h i , Y. K u r o i w a , A. M i u r a , M. I z u g u c h i , “ T h e r m o e l e c t r i c P e r s o n s b a s e d L a y e r e d S u p e r c o n d u c t o r ” J . P h y s . S o c J a p (2019) 024705/1-5.
- [3] T. W a k a m a t s u , G. K a w a m u r a , T. A b e , S. K a w a g u c h i , C. M o r i y o s h i , T e r a s a k i a n d “ H S T a m i g u n a i l t H h a s a n e l i p r o s t y s i d f t h e R e l a x o r - i n I o m p e r F o e l e o c n t t r i u d n S S t r u t e d C a l c i u m . S u P l h y o s a . I s u n o i n . a t J e p (2019) 034718/1-6.
- [4] R. S o g a b e , Y. G o t o , T. A b e , C. M o r i y o s h i , Y. K u r o i w a , A. M i u r a , “ I m p r o v e m e n t o f r i g S u p e r c o n d u c t i v i t y H i d g u l c M i x i n g E n t r o p y a t B l o c k B a s e d S u p e r c o n d u c t o r ” I n o r g C h e m (2019) 43-49.
- [5] K. S u d o , Y. G o t o , R. S o g a b e , K. H o s h i , A. M i u r a , C. M o r i y o s h i , “ D o p i n g - i n d u c e d C o r i y n i P r o p e r t i e s i n T e h c e t r m i o c e A l g (S d i j S d b) S e S o l o u t ” I n o r g . 5 (2019) 7628-7633.
- [6] J.-K. C h e n , J.-P. M a , S.-Q. G u o , Y.-M. C h e n , Q. Z h a o , B.-B. Z h a n g , Z.-Y. L i , Y. K u r o i w a , C. M o r i y o s h i , O. M. B a k r , J.-Y. Z h a n g a n d H.-T. S u m e , “ E m i n g i A l l - I n o r g a n i c P e y o v a s k i E d N h e d - E d b y s A M i d n a , I P a C h e m M a t (2019) 3974-3983.
- [7] J.-P. M a , J. Y i n , Y.-M. C h e n , Q. Z h a o , Y. Z h o u , H. L i , Y. K u r o i w a , C. M o r i y o s h i , B a k r , O. F n M e h a d H.-T. S u m e , “ D e f e r e d P h a s e T r a n s i t i o n i n A l l i d e P e o r v s k i n t o e c N y A G S i l M d t l t e (2019) 185-191.
- [8] H. Y u w e n , Y. G o t o , R. J h a , A. M i u r a , C. M i z u g u c h i , A. Y o K u i r a o n i d w Y a M i z u g u c h i , “ E n h a n t c i e v d i S u p e r c o n d u c t i v i t y i n S n A s - b a s e d L a y e r e d N a x S x A s ” , J p n p p l A 5 B h (2019) 083001.
- [9] H. I t o , A. M i u r a , Y. G o t o , Y. M i z u g u c h i , C. M o r i y o s h i , Y. K u r o i w a , W e n , S. N i s h i o k a , K. M a e d a , Y. M a s u b r u c h i , K. N . T a . d R a o n s a e g r a o - N A n E d c o t n r i c S t r u c t u r e G o v e r n e d b y t h e t D e i s p l i c a n t e S i m e d r t a o f

- L. I. (S. L. A., C. D., D. T. 4 (2019) 12272-12278.
- [10] H. L i , X.-F. J i a , Q. Z h a o , J.-P. M a , J.-D. L i u , B.-J. Y e , Y. K u r o i w a , C. L i .-Y. Z h a n g a n d H.-T. S a n t i f i c a t i o n o f L a y e r e d B i l a y e r s i n B i g I t i r a b r o f i d N r e a d - I n L u m i c n e e n s C h e m . 2 5 (2 0 1 9) 1 2 8 4 2 - 1 2 8 4 8 .
- [11] M d . S a z i z d a m a Y o h h i d a , T . T a k e i , S . Y a n a g i d a , N . K u m a d a , M . N a A z u m a , M . H . K b R 1 , C . M o r i y o s h i a n d Y . K u r o i w a , “ H y d r o t h e S t r u c t u r e o f B a Q B D o u b l e - P e u p e s k o n i d u s c o n s e v t o f t h e T r a T c ~ 3 0 K ” l , n o r g . 5 (2 0 1 9) 1 1 9 9 7 - 1 2 0 0 1 .
- [12] R . M a t s u m o t o , Y . G o t o , S . d Y a , n h a t h o u t i n , K . M i u r a , C . M o r i y o s h i , S . A a c h i l , m i n f e , H . T a k e y a , H . T a n a k a , K . K u r o k i , Y . M i z u g u c h i a i n d u c e d S d u p c i v d i o y i n t h e L a y e r e d B i n 2 S o B o s g (n O b i a s e d l e n i d 0 . 7) ” , P h y s . 1 E R C e (2 0 1 9) 0 9 4 5 2 8 / 1 - 1 0 .
- [13] S . O k a d a , E . N o d e , K . T a k a g i n Y . k F i u d j o i , K a M a r Y . y E o s h i a n d Y . “ S y n t h e s i s o f S m e r H a v i n g a N e w L e i t e y l b o y f H g i e d c h e r e a s r e c i v o f C o e t y i i n W a s h i n g S t e p o f R e e s u l c j A o i y o n d 8 C C (2 0 1 9) 2 3 7 - i o n P r o 2 4 2 .
- [14] K . O h w a d a , K . S . A g a w T . U a n o , A . M a c h i d a , T . W a j a i n , u S k W , a S d W e n o a n d Y . K u r o i w a , “ D e v e l o p m e n t o f a n A p p a r a t u s f o r a g r i B a g a g g a n d i t p A l a o n i t o t h e D h n o n m s l i l m a g i n N a o n f o B a r T y i P o n a l s ” , A p p l P h y s (2 0 1 9) S L L 0 5 / 1 - 5 .
- [15] S . N o d a , Y . Y o k o i , Y . N a k a h j i i r i a , T . W a a b d e a y G . E m o i r a n d Y . K u r o i w a “ S t r u c t u r e o f F l P u N M 3 O a i n t h e C u b i c p n P . h a J s . e ” A S (2 0 1 9) P h y s . S L L A 0 6 / 1 - 5 . C . M o r i y o s h i a n d Y . K u r o i w a i g w a u d o n r e s p o
- [16] H . N a m , S . K i m , G . P . K j h i a n S l I n e d n F u W a d a , “ T h e e a n h i a i l n d n n e d r e c o v e r y o f d a m a g e d s u r f a c e c h i a t y e i r n f B c i r e b r a s m p d i s e d . f e r r A p p l . 5 (2 0 1 9) S L L 0 4 / 1 - 5 .
- [17] P . S a p k o t a , S i U e G . P . K . h f a u n a n d , S . W k a i d n a a “ I n f l u e n c e o f f e g r a n i d n B a / T i r o a s d e i c e t l r i c e , f e r i e , a n d l p e i c p t e i r i e s o f B e a r T a i n P i r e s ” J . A p p l . 5 (2 0 1 9) S L L 0 5 / 1 - 8 .
- [18] T . W a k a m a t s u , G . K a w a m u r a , T . A b e , Y . N M d y a n s i r K a u Y . K i a w a a , J . u c h T e r a s a k H . T a n i g u c h r i e , e “ A m i t t i f f o e A e n t r i c - R e l a x i o n P i h n a s e T r C a l c i u m i S u t m r S u n l f e o t a o n g i n 5 (2 0 1 9) 1 5 4 1 0 - 1 5 4 1 6 .
- [19] M d . S a i d u z z a m a n , S . W a n i , T . T a k e i , S . Y a n a g i d a y N . S k h u i m a d a , a n d Y . K u r o i w a , “ S y n t h e s i s a n d C r y s t a i l t S n a u e t w i r t e h o t f l P y r o c h y p o S e t e t l i c C u e S a m . 1 2 (2 0 1 9) 9 5 2 - 9 5 7 .
- [20] H . N h . n F j u i , i K S m , T z A a i w S a U r e o a n d S . W e f l f a e - s i t t e o f o A f f - s t o i c h i o m e f e r e e t r i e z a n e d l p e i c p t e i r i e s o f B i a (N 2 F 1 0) O 3 - B i F 3 e Q r a n d i c C e , r a m . S o c J 1 p 2 (2 0 1 9) 3 6 9 - 3 7 3 .
- [21] S . K i m , G . P . K h a n a l , j H i . N , a S m , I n e d n F u W a d a , “ E f f e c t s o f A C - a n d D p o n l g i o n p a e z o p e p e r s o f B e - r b a a n i e c d C S , r o a m 1 2 7 (2 0 1 9) 3 5 3 - 3 5 6 .
- [22] G . P . K h a n j a i l i , S . K u i m , S . U e n o , T . S . S u z u t k i i n a o i n d o S . W t o i n p , a “ r O a p c o n d i n t s i o f h i g h l e y z t o e x l t e a s K o , 9 T i p Q B i r a m l i c s C e r o a p n n 1 . 2 7

- (2019) 362-368.
- [23] R. S a s a i , H. S a t o , M. S u g a , T. S a i t o , H. U h a r a , K. M e t s u , S. T a n i , S. O h i m i , N. O i t a , M. N u m a , Y. F j i m u r a , S. K a w a g u c h i , Y. K u r o i w a , A. A u b r e a a n d C. M o r i y o s h i “ W h y D o C a r b o n a t e A n i o n s H a v e E x t r a c t a n d E n c o u n t e r I f G l a s s e r i s i n D o u b l e H o x i d e s ? C a s e S t u d y o f L a y e r e d M o n o l a y e r A H l y (M g / A l = 2) ” , I n o r g 5 8 (2 0 1 9) 1 0 9 2 8 - 1 0 9 3 5 . C M o r i y o s h i a n d c o a u t h o r s
- [24] R. S a s a i , M. N u m a , N. Y a k a y a s h i , S. H a g a , K. H a g u r a , T. A b e , C. M o r i y o s h i a n d S. K a w a g u c h i , “ D e v e l o p m e n t o f a N o v e l X - r a y R e s o n a n c e D i f f r a c t i o n M a s u r e m e n t S y s t e m f o r I n t r i n s i c S t a l S t r u c t u r e i n A D u r g C h e m i c a l R e a c t i o n : A p p l i c a t i o n t o t h e A n i o n e x c h a n g e R e d D o u b l e H y d r o x i d e C h l o r i d e B a t t e r y ” , J. S o l i d S t a t e E l e c t r o n i c s 9 . 2 (2 0 1 9) 1 0 8 6 - 1 0 9 2 .
- [1] N. F j i m u r a a n d Y. K u r o i w a [G u e s t E d i t o r , A n A C h e m i s t r y a n d G e o c h e m i s t r y I w a t a , K. K a k i m o t o , I. K a n n o , K. K a t o , S. K o j i e n a e , H. N a g a t a M a t e r i a l s T h e i n J a p p J p n a t J . 5 8 A , p p 2 0 1 9 - 2 0 2 0 . S p e c i a l I s s u e 4 3 , T h e J a p a n S p e c i a l I s s u e B o o k S A I O P 2 0 1 9 b I l i s h i n g
- [1] Y. K u r o i w a a n d S. T a n i “ S t r u c t u r e a n d P r o p e r t i e s o f F i n e S c a l e d B i - B a s e d A e r o s p o l s D i e M e t h o d ” , T h e 1 1 t h C h i n a a n d J a p a n e s e M a p t o e r i u m a n d T h e i r a p p l i c a t i o n s (C i J F M A 1 1) , (2 0 1 9 . 9 . 2 2 - 2 5 , G r a n d M e t r o p a m k g H o t e l N a n j i n g C h i n a) .
- [1] S. W a d a , R. K u m a r a n d S. U e n j o i , I. E g u m a e , C. M o r i y o s h i a n d Y. K u r o i w a “ P r e p a r a t i o n o f B i - B a s e d N a n o - s t r u c t u r e d C e r a m i c s b y S o l - g e l M e t h o d a n d T r a n s f e r t o F e r r o c e r a m i c s ” , 2 0 1 9 I n t e r n a t i o n a l W o r k s h o p o n A c o u s t i c M a t e r i a l s a n d D e v e l o p m e n t (I W D E M) 2 0 1 9 . 5 . 7 - 9 , T h e P e n n s y l v a n i a S t a t e U n i v e r s i t y (P a , U S A) .
- [2] S. K i m , I. F u j i , S. U e n j o i , C. M o r i y o s h i , Y. W a d a ; “ R a o a l o c a t i o n o f B i - B a s e d C e r a m i c s i n B i - b a s e d P i e z o e l e c t r i c E E R a n t e n n a s ” a S y m p o s i u m o n A p p l i c a t i o n s o f F e r r o c e r a m i c s (F E R C) , I n t e r n a t i o n a l C o n f e r e n c e o n F e r r o c e r a m i c s E u r o p e a n M e t a l F o e i e t y (E M F) t e r m i n a l W o r k s h o p o n M E M P I M a n d P i e z o e l e c t r i c F o r c e M i c r o s c o p y J W o r k s h o p (2 0 1 9) e n (2 0 1 9 . 7 . 1 4 - 1 9 , S w i s s T e c h n o l o g y C e n t e r , L a n s e , S w i t z e r l a n d) .
- [3] H. N a m , I. F u j i , S. U e n j o i a n d S. W a d a ; “ D e f e c t - B a s e d C e r a m i c

Ceramic Piezoelectric and Piezoelectricity in the Piezoelectric Symposium on Applied Ferroelectricity (IAFE), International Conference on Ferroelectricity (ICFE) and Ferroelectricity (FERRO) and Piezoelectric Force Microscopy (PFM) by J. Wang et al. (2019), (2019.7.14-19, Swiss Technical University of Zurich, Switzerland).

- [4] P. Skptaj, J. F. S. Kim, S. U. Wadood, P. Shenpa, et al. Iröptir of Mn-Nb Co-doped Barium Titanate Ceramic. In: 11th International Ferroelectric Symposium on Applied Ferroelectricity (IAFE), International Conference on Ferroelectricity (ICFE) and Ferroelectricity (FERRO) and Piezoelectric Force Microscopy (PFM) by J. Wang et al. (2019), (2019.7.14-19, Swiss Technical University of Zurich, Switzerland).
- [5] L. Wu, T. Abe, C. Mori, Y. Kuroiwa, M. Suzuki, R. Aoyagi and J. Chatterjee. "Piezoelectricity of P(VDF-TrFE) Films Evolved by Surface Reactions during Diffusion", The 11th China Academic Journal Symposium on Applied Ferroelectricity (IAFE), (2019.9.22-25, Grand Metropolitan Hotel Nanjing, China) Poster Award
- [6] Q. Zhang, A. He, C. Morsini, A. Taguchi, H. Moriwake, H.-T. Sun and Y. Order of Bi-Iron based Gd-doped BiFeO₃ Piezoelectricity. In: 11th China Academic Journal Symposium on Applied Ferroelectricity (IAFE) and The International Ferroelectricity Symposium (2019.9.22-25, Grand Metropolitan Hotel Nanjing, China).
- [7] S. Wada, R. Kayanuma, Y. Isobe, K. Majima, C. Mori, S. Ueda, K. Furuiwa. "Influence of Energy in Perovskite-based Nanometric Piezoelectric High Piezoelectricity of P(VDF-TrFE) Nanofiber Membrane. In: 11th China Academic Journal Symposium on Applied Ferroelectricity (IAFE) and The International Ferroelectricity Symposium (2019.9.22-25, Serbian Academy of Sciences and Arts).
- [8] Y. Nakahira, G. Kawamura, T. Wakahara, Y. Kuwano, I. Terasa, T. Taniguchi; "Structural Analysis of P(VDF-TrFE) Films by X-ray Photoelectron Spectroscopy". In: 11th China Academic Journal Symposium on Applied Ferroelectricity (IAFE) and The International Ferroelectricity Symposium (2019.9.22-25, Okinawa).
- [9] T. Abe, L. Wu, C. Mori, Y. Kuroiwa, M. Suzuki, R. Aoyagi and J. Chatterjee. "Piezoelectricity of P(VDF-TrFE) Films Evolved by Surface Reactions during Diffusion", The 11th China Academic Journal Symposium on Applied Ferroelectricity (IAFE) and The International Ferroelectricity Symposium (2019.9.22-25, Grand Metropolitan Hotel Nanjing, China) Poster Award

Al Layer on the Hydroxide (Mg/Al = 2) under High Pressure and High Temperature
Rimochi Conference on Ceramic Science, (2019.10.27-31) Okinawa Convention
Center, Okinawa).

- [13] S. Wada, R. Kayanuma, Y. Ise, T. Ueda, E. M. Fugome, C. Moriyoshi,
Kuroiwa; "Preparation of Nanosystem Nano-structured Ceramic
Solid Electrolyte Method and its Application", US-Japan Seminar on
Solid State Ionics, (2019.11.5-8), Ramada Plaza (Johji H
Je, Korea).
- [14] S. Kim, S. Ueda, S. Wada; "Preparation of Material for Magnesium
Solid Electrolyte Ion's Off-center Electrolyte High Capacity Ceramic
International Conference on Solid State Ionics (2019.11.5-8), Ramada Plaza (Johji H
Je, Korea).
- [15] H. Nam, J. Kim, S. Kim, S. Wada; "Development of MgO-B₂O₃-B₂O₃
Ceramics by Various Core-Shell Structure of Fe₃O₄ and Perovskite
Thin Film on the Surface of the Electrode", The 5
International Conference on Solid State Ionics (2019.11.5-8), Ramada Plaza (Johji H
Je, Korea).
- [16] H. Malik, S. Kim, I. F. J. Si. W. S. D. Ueda; "Fabrication of Oriented
Ceramics by Gradient Method and its Application", The 5
International Conference on Solid State Ionics (2019.11.5-8), Ramada Plaza (Johji H
Je, Korea).
- [17] R. Yamauchi, S. Hobb and Y. Kuroiwa; "Fabrication of Perovskite
in BaTiO₃ Polyhedra", 2019 Korea-Japan Symposium (Rusumi N
Hiroshima, (2019.11.7-9), Busan National University, Korea).
- [18] H. Kaneshima, T. A. M. A. Miyoshi; "AI × CNTs for a Masking
Which Predicts the Diffusion Coefficient", 2019 Korea-Japan Student
(Pusan National University Hiroshima 2019.11.7-9, Pusan National University,
Busan, Korea).
- [19] T. Abe, L. Wu, C. Moriyoshi, Y. Kuroiwa, M. Suzuki, R. Aoyagi
Characterization of the Solid Electrolyte Membrane Fuel Cell
Reaction X-ray Diffraction Conference on Solid State Ionics (2019.12.17-20,
UTown, National University of Science and Technology (Seoul)
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- [1] _____ 2019 Korean - Japanese Student Exchange Program
 University of Hiroshima 2019 in Meiji City 40, Mechanical
 Engineering Department, Busan National University, Korea
- [2] _____ Organized Symposium 22, "Layered Double Hydroxides
 of Binding with Charge Transfer by Pearce's" in the International Conference of
 2019 10 27 - 11 1 50 Okinawa Convention Center
- [3] _____ International Polymer Chemistry Meeting 16th Conference of the
 Crystallography 2019 A12 17 - 20 500 National
 University of Singapore

- [1] _____ "Nanoporous Carbon Frameworks for CO₂ Capture"
 Department of Chemistry, National University of Singapore, Singapore

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- [2] C o a n l i p s o u r t f o r d o u b h e l - a p p a r d i u m ;
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Sumiyama T. High Pressure 40, 130-139 (2020) [10 Pages] 1080/08957959.2019.1702175

[4] Anapoliof NPD to double-sided XAS is presented a novel method in high pressure 0006;e 3
 K. Kuramoto, T. Natsui, T. Sakai, N. Kawamura, T. Irif High Pressure 40, 119-129 (2020) [11 Pages] 1080/08957959.2019.1702174

[1] Niobnik, Seiyal Fan dan Edita; c p f o i n e s l e d o r f e c t i v e s t a t e s o f B T O s t u d i e d r e y s o l v e d o X R a y a b s o r p t i o n i n 1 1 t h C h i n a a n d J a p a n F e y o n e p l o r s i c u m d e h e a d a t p i p (C i J F M A 1 1) 2019.9.22-25 Najmig, China

[1] Fan Dongxiao in the study of mechanism of self-act with the help of the first-principles calculation in the China and Japan Science Olympiad Materials Research (CiJ FMA 2019) 9.22-25 Najmig, China

[2] Miou Kousa, Shun Iwasaki and Naoto Iwamoto in the study of the structure of Fe-Ni Inval Alloy Fe72Pt18AS studied by XRF Korea-Japan Student 2019.11.7-8 Pusan Noan, Busan, Korea

[3] Kearo Kuramochi, Inami Natsui, Gheo of XAFS under the multi-Mb pressure double stage edly in 2019 Korea-Japan Student Work 2019.11.7-8 Pusan Noan, Busan, Korea

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b ú • + Ū 8 _ Z < • s 8 j c | C f ? W Z 8 ^ 8 Q G [• % Ê ' 2 [c > * Õ µ É b < X k Ñ ö
\ 5 6 ë k Ñ ö † ì _ 1 * m • G \ † % \$ x \ K Z > * ¢ 7 Ý œ K S P î " î K H 9 # Ý 8 S
9 x (0 Ž + b Đ - j ß 0 ... Ø (0 Ž œ 7 Á Ê (œ \$ 5 3 (6 † Q # Ý K Z > * Y 2 Š » î É % L 7 &
b 7 Á Ê " g Â b ' 5 6 ë k Ñ ö † 1 * m S Q b) Ý > * 2 x _ Õ µ É \ Õ µ É b ± A I b)
* (k Ñ ö @ 0 { I ∈ S

, Ê 2 x _ " @ 2 A b 7 Á Ê S 4 b % Ê ' 2

5 j 4 ß i " @ (Ô x 5 r % É (ò (Ô [\$ Í # ' M • 9 x 2 x _ c > * ¶ # . 1 = [c 1 Â b X ? ^ 8 # ' 1 ß \ K Z > *
+ Æ á † 7 Ý u Z 8 • • % Ê ' 2 ç Ý í É [c > * (ø ¥) z 8 • æ b 7 Ý œ P î " î x : U œ † š 2 s œ \ M
• 9 x (0 Ž + 0 ... Ø (0 Ž œ 7 Á Ê (œ † # Ý 8 Z > * , Ê ["] ^ 2 x _ \$ Í # ' µ S b 0 Ž Â _ î S K Z 8
• Ý , 3 ~ Ò * (n K S ™ " g Ü á ì • Ý ¥ ¢ ¼ - » 2 x _ / = U / X 3 ; ; 6 b % 6 0 h) z œ
7 Á Ê (œ 9 , † / œ 8 > * 2 x _ † , : 7 Á Ê S 4 † a # ú [6 u Z % \$ K \$ x _ 0 { K S 3 b Æ † =)
@ (/ ä K Z 8 • G \ † \$ Í 0 b K > * 3 b z Æ í j @ / X (n _ | W Z M ¼ _ H b 9 & ã • M • G \
† X A \ u S G € c > * § - 1 8 † S B K Z 8 • 3 b o X @ í ? } _ š i K S G \ † & g
K Z > ~ > * - (ò 6 ë b 7 Á Ê b x ~ \ ~ b] Ê @ 8 Â K S Ú b - (ò b Æ † =) _ X 8 Z v Æ í
j) * (b & ã • † ì K > * & ã • 5 b - (ò k Ñ ö ?) > * Ü a µ ° í Â á » e @ _ | • 1 Â @ 7 ' K
C > * / X (n @ o 7 Á Ê • b Â á » S 4 † 2 A \$ x _ š i I O Z 8 • G \ † 0 É K S I } _ > * / X b
* (n 5 † Q x M G \ [> * Ç ™ Ý Ñ ' f b « ì j ° Ý I Ø @ ô í _ Q ± M • G \ † & g K > * Ç ™ Ý
Ñ =) _ > E • 7 Á Ê " g Â & Ø b Q • @ 7 F V _ \$ Z K Z 8 • G \ † æ - K S G € _ | ~ > *
™ " g Ü á ì • Ý ¥ ¢ ¼ - » 2 x _ / b / X (n _ | • 7 Á Ê S 4 b š i _ X 8 Z " C b % ± 0 b † v
S } K > * 7 F V b K C s _ X ^ @ • 9 , \$ x 0 É Đ @ f & g I ∈ S

Ý, ½ ~ Ò4ß ì" @2x _/ 6 L5 X 2_ > E • " / Ý b è0É
Ý, ½ ~ Ò4ß ì" @ 6 L5 X 2c > \$ % \$ x 2x _ 7 & a . @ \$ í # ' M • b s ^ } N > * æ / ² \$ x ^
- 1 % & 6 ð " @ 2 A \ K Z % ± } ∈ Z 8 • 7 Á Ê " g Á b 0 { ! ! ? } 2x _ μ S † 0 Ž Á M • _ c > * 2x
_ \$ í # ' _ 6 ð f • 7 Á Ê í î ^ - á % & « 8 # Ý \ > * 1 % & 6 ð (Ô b " ! © [6 • 1 8 7 Á Ê % & 6 ð † (7 ³ K > *
5 0 Ū o M • G \ @ # . • \$ x [6 • K ? K > * 0 ... Ø (0 Ž œ 7 Á Ê (œ \$ 5 3 (6 % \$ K 0 { 1 ∈ S 5 X
G_j G_364 (# ä ¶ b 7 Á Ê Â á » _ > C % & « 8 # Ý b 2 s ; _ 6 ð K Z 0 Ž 5 @ (? ∈ Z 8 • 3 ū - > * 7 Á
Ê % & 6 ð \ « Æ á 364 (% & « 8 # Ý † v ~ ° ∈ S # . 1 = 0 £ ì [c > * Ç ™ Ý Ñ =) 3 Æ _ > E • Â á »
b) P ~ 3 , s @ 4 # ` 0 Ū o I € > * \$ 5 3 (6) Á î « í Ç " á " Ý Ç ™ á Ý b) Ý † 1 Á [A ^ 8 ' ¶ c > * G b j († 6 S M 0 [I \ K Z > * Ç ™ Ý Ñ =) 3 Æ [b 0 X b î ^ - á Ô î »
\ b) œ @ z G I ∈ Z A S > + , Z D H W Z K V 5 H W W H M @ > * 3 Æ ° b
È < X 8 • æ b \$ 5 3 (6 ?) > * Q I K S « Æ á 364 (% & « 8 # Ý b _ ° _ | ~ 7 Á Ê % & 6 ð b s] P
~ 3 , s † í # [A \ b z G v ^ I ∈ Z 8 • > \$ 7 D P D L K H W B Θ Y ; @
Q G [% Ê ² [c > * È < X 8 • æ [b 7 Á Ê í î ^ - á % & « 8 # Ý † μ u S " / Ý b ì è 0 É † %
\$ x \ K Z > * È á ± Ū : U œ & É Ū % Ê ² - á ± î > & % / > ' _ > 8 Z > * 9 x (0 Ž + \$ 5 3 (6 , † / œ W
S È < X 8 • æ [0 { K S \$ 5 3 (6 ì ; ° Ý _ P K Z > * « ì ; ° Ý g " g 0 Ž Ò ? } Â á » (S
† ô K > * + - k š ĵ Ý î b 4 Š † _ K S Q b) Ý > * < X _ k } N > * 0 X b S 4 @ 0 {
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9x (0Ž+ \$ 5 3 (6 # Ý 8 S 5 ; 4 ß ì " @ 9x 2x _ / b " / % & « 8 # Ý b 0 Ū o
5 ; 4 ß ì " @ @ & g M 9x 2x _ b Ó • ½ ~ Ò b 0 Ž Á _ ¥ E Z > * 0 ... Ø (0 Ž œ 7 Á Ê (œ \$ 5 3 (6
Ý 8 S " / % & « 8 # Ý b 0 Ū o @ È C / œ f ∈ Z 8 • / 0 5 ; 4 ß ì " @ / D 1 6 [L & X 2 / 6 & 2 c > *) S
4 b - ö @ 9x 8 S u _ , 2 A ^ \$ 5 3 (6 ì ; ° Ý b v " @ T 7 ' ^ (Ô [6 W S @ > * æ (ö + ' ¼
b ¥ V \ \ v _ « ì ; ° Ý b 2 A @ 5 • K > * | ~ (- Ø b 9x 8 " / % & « 8 # Ý b 0 Ū o @ • + \ ^ W
Z A S 3 Æ ° [c > * Ç ™ Ý Ñ =) 3 Æ b 7 Á Ê b S ~ & " á @ > * š ĵ Ý í < X _ k Ñ K Z > *
Ç ™ Ý Ñ @ / \$ x ú • + Ū 8 ?) 4 + : M • G \ @ ì I ∈ S > - Q K J D H W 1 D D P P X & Q
@ % > * C v 9x (0 Ž + \$ 5 3 (6 | ~ > * È š ĵ Ý î 8 • æ b Â á » (S † è 0 É K > * o
I & " ö b « Æ á , } B b š ĵ Ý î « £ í Ý (Ū H 7 Á Ê í 7 Á Ê % & « 8 # Ý # ä ¶ \ * f < } ∈
• Â á » b) P ~ 3 , s @ " I © Ū E } ∈ • G \ † 0 b K S K ? K > * Ç ™ Ý Ñ =) 3 Æ b Â á »
_ > C % & « 8 # Ý † # . 0 Ž M • S u _ c > * 7 Á Ê í 7 Á Ê % & « 8 # Ý T E [^ C > * 7 Á Ê í î ° á % & « 8
Ý † u \ K S > * Q b Ū b % & « 8 # Ý † μ u S * f 9 @ ² 0 [[6 •
Q G [% Ê ² [c > * Ç ™ Ý Ñ =) 3 Æ _ > E • / 6 & 2 " / % & « 8 # Ý b > A † Â } ? _ M
• G \ † % \$ x \ K Z > * q 4 : » î É / 6 & 2 [b 9x (0 Ž + \$ 5 3 (6 † / œ W S 9 , c È á
± Ū : U œ & É Ū - á ± î | g « ± á Ç › î » : U œ † 0 ĵ _ Z / œ W S 7 Á Ê í î ° á % & « 8 # Ý
† μ r ^ 8 \ M • Â á » (S † § 6 ð X _ | ~ ì K > * 9 , [" } ∈ S Â á » (S \ b j (†
† v • G \ [> * 7 Á Ê í î ° á % & « 8 # Ý † z _ o î M • * f < } ∈ • + - k š ĵ Ý î b 4 Š †
_ K S \ G • > * " I © \$ x ^ S 4 @ (Ū P H Θ P H 9 Ñ ~ M • G \ ? } 7 Á Ê í î ° á b) œ
@ I C & g @ I O •) Ý @ " } ∈ S

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> @ ; : D Q J - & K H Q 0 = K H Q J 7 9 0 H Q V K F K L N R Y D , 3 5 X V L Q
: X . 6 X P L G D 7 < R V K L N D Z D . 0 L \ D P R W B K L O P D I G B Y P D N P D (W 7 2
\$ H 0 K S Q X N R Y \$ „ Pi 9 wwwp ð P .

VPPRUSKLF VHPLPHW 5 0 Y+1 0 L6 ' 3K\V
> @ 7 <RVKLNDZD . 6XPLGD < .VKLGD RN&K2Q (07HUHVPIOPHWC
6 6KLQ \$.LPXWRD D 0 2 ESKLURM R YRQO W DVIRIS Q LRJLK OVD W5HY ' %
> @ 7 RQR .DNRNL 7 <RVKIDNDZD6XPLGD . 0L\DPRWR 7 0XUR
6 DRK . *RWR < 6DNXUDED . +RQR \$ LWLPRUDWWDVHHHRCV&R
UHHYDCHGJHVRQDIQFVCSKBSWRWDRVFRS\ ' 3K\V 5HY %
> @ . 6XPLGD 0 .DNRNL - 5HLPDQQ 0 1XLRKPDW\$ 6.RNRWR
2 (7HUHVKFKHQNR - *•GGH 8W\LFHUPVQXKLFHCU DROCDWRBWL
XOWUFD D D VCHDPLFVULLQRVWRIRSFVQBOLLQVXQDWRUHZ 6E 3
> @ 0 <H 7 ;X * /L 6 4LDRK<67D-NH& @ 6 UPDPDW . 6XPL
6 6KLQ \$.LPXUDH 3RQDRO UHVSRCULRBNLIRBUIGRUSHG WKH
WRSRDBJLQVXGEV\BU7H ' 3\V 5HY %
> @ . ,WR < <DVXWRPL 6 =KX 0 LRKUPDPDWR <5 7\$NLHGPD<\$6D
7 6XHPDVX 3RQRLS WDDWDDWDDW DQG SHUSHWGEFFRSDURVDJQH
HSWD\LD01&RLOPK\V 35HY %
> @ ' \$ (XQLQ QIRPV.NLNK \$ 0 6KLNLQ () 6FKZLHU 0 0 2
.XPDU 6LORRY) =O6H\$ 0 % %DEDQORYDQGLJQDWXUXOV RI WH
GULYHOU DROVLLIFVRQDQQLHVVQLHFWU XFWXUHLQVW 6DWRRJ DQ%L
\$3/ 0DWHU
> @ . 7DJXFKL . 6XPLGD < 2NXGD . 0L\DPRWR \$.LPX
36SFWURVFRSLF HRQGHGQFHHRMOKKED W\SWQGVSRQW6ED
\$X VXDFA\V 35HY %
> @ 0 0 2WURNORRYV,NLNK + %HQWPDQQ ' (VWLXQLG \$D%HX
\$ 8 % :ROWHU \$ 9 .RUOHYD \$ 0 6KLNLQ QORY% \$ DQFR 5H
9\DJRYVND\D 6 9 (UHRPUNHY 9X0 0.X]QHWVRY))UH\|VH - 6iC
5 \$PLQDRWOD % %DEDOORRY 11 \$ \$EGXO OBYHHURIQVBY\$OI
.DWHY% %•FKQHU () 6FKZLHU 6DFXEDU* \$'L.16DXQVDR /5 3 8W9
6FKDW] . .L%QCPDQQQDQ+6LPRQ ORVFRWR 5 5)H3QHLUW \$ ()
3 0 (FKHQLDTHQD\$D, V &KXOMRY D3G HRFVFRUD D DQWLLIFHUURP
WRSRQBOLLQVXODWRU ' 1DWXUH
> @ 1RYDN 6 1 =KDQJ DQMBZDQL(JXIFKL \$.LPXUD ; ; :DQJ
8FKLGD 0 6DWR\H 9 6 :XQRYLBNB+LJKO\ DQLVRWURSL
PDJQHWWRDHLQ =R3D6QQD FLVHPLPHW DSHY 3 %
> @ \$ Ū μ ° ĩ ß a • Ÿ) / b œ 9 Q • 1 • Ū μ j 7 Á v b 0 { œ Ø < X « Æ å ° ß ½ j
« _ ¥ EZ > & 0 Ž 1 » * Â # Ÿ " @ # . " s • SS
> @ , ZDVVDZD 3 'XGLQ . , QXL 7DFKDRVXDQG 0. +RPHV&K & 3% XUL
& X2 FKDLQ & X2QX-QFRYHUHG E\ QDQR \$53(6 ' 3K\V 5HY %
> @ ' :DWVRQ 3 'XGLQ / & 5KRGHV ' 9 (YWXVKLQVN\ + , Z
% %•FKQHU 0 +RHVFK DQG 7HERQLWUXJFURBHQJRWPKHV
DWLIURRQWLF \$ DLRQH GRPDLQ ' QSM 4XDQWXP 0DWHU

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- > @\$.LPXUD SR, VDE RUDWQMP RQWBRDLODWHULRQDO ; QWNHUKQDSWR
 39DULHW\ DQGRXEXYHNUMSBRQVFRQEHIVEQOWSISRDRHOLGURW DWRH
 SK\VLVW WROW QDRQVCHISWPL\$ >%(%XON (GJH %RXQGDU\ &RUUH
 2QOLQH
- > @\$.LPXUD 3, QBRUQSRQNDPW LQWRL FDRS ROD WHU WLOXHWFRQV, 'QQRYD
 ODWHULBDDVFKKQVHHVLO <RNRKDPD 6\PSRVLD
 -DSDQ
- > @\$.LPXUD SR, VDE RUDWQMP LQWR ' ODRWHDYKIDQVVRU:RQQVKRS RQ
 &DULRS LQJ LQ WZR GLPHQVLRQDO OD\HUFHGRSBUWHU LDDQV
 HOFFRQLFFGHDFSRVLV &\$ ' &HQLW)HRG, &BQSDMDO\
- > @\$.LPXUD 3, VDE RUDWQMP LQWR ' PDQVWLDYHQRVLRU IQG
 , QWVRLQDO OLFURSURFQHWKQRDQRQFHUHQI &
 , QWVRLQDO &RQI&HQRVHU +LURVKDSDQ+LURVKLPD
- > @_.ZDVDZDJOH\$5HVROYHFCVURQRV6SHGWURVFRS\ ' 0,5\$, 3K'
 (/(&7521, \$1' 0\$*1(7, & 3523(57, (6 2) 0\$7(5, \$/6 86, 1* /(\$5*(6&\$
)\$&, /, 7, (6 +LURVKLPD) BQDQHUV
- > @_.ZDVDZD WLDGOSD UKRWRROVHLS SWURVFRS\HR, QGRLRHRXV &XSUDV
 6\VWHPV ' WRKQDQ&RUCQDQDQR)QQPFXDID)FHV , & \$VWHU
 3DJD +LURVKLPD -DSDQ
- > @_.ZDVDZD 36SDWLDQO\ UHVRSOSUHQW\$H53(6SRQFRQDQKDFRUV
 :RUNVKRS RQ 6WRQRQD&RUSLQDQ 5HWROY6SHSKBRQDFFPL
 2[IRUG 8.
- > @_.ZDVDZD RQUPHLSHQVBRQD W VHOXFWXUH RI <%&2 VWXGLHG
 6XSHUVWULSHV ,VFKLD ,WDO\

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- > @ *RWR < 6DNXUDED < 0LXLDLVXL .XUQLDZDQDMDUL= \$KHQ
 .LPXUD RQR 37KH DWRPLF RUGHULQJRQHLSHQVGHQFFWHQDHFDDQKD
 &R)H *D'H +HXVQRHURDVHOUYHG E\ KDUVRQ USHSWRWRFRS\ ' \$C
 &RQIFUHRQ 0DJQGVQDWRFDQDWHULDOV 0005LR \$OO 6XLWHV +R
 &DQR /DV 9HJDV 86\$
- > @0 1XUPDPDW 7 <RVQLNDZD7D;NHPRBMY 6 + 0&KERNL 7
 .RQR 7 0XUR . =KDQJ 6 .XPDU (6FKZLHU . 0L\DPRWR
 3'LFHW HYLGHQFHERONDKHFROSHLQD VHDQVO GLFKDOFRJHQLGH
 , QWVRLQDO &RQI&RQLQGLQPMV)6& \$67(5 3/\$=\$
 +LURVKLPDSDQ
- > @ *RWR < 6DNXUDED < 0LXUD , .XUQLDZDQ \$MLLDLVXL /
 .LPXUD DQR 47KH DWRPLF RUGHULQJ RQSHHQVGHQFFWRUHYD
 PHVOLFH&R)H +HXVQRHURDVHOUYHG E\ KDUVRQ USHSWRWRFRS\ PL

7KH WK , ~~WVNDQ & RQIHQRQE Q GLOPUM~~ 6 \$67(5
3/\$=\$ +LURVKSDD

> @; ; :DQJ - + &KHQ 0 7 =KHQJ 0 1RYDN) 2UEDQLü ()
7 <RVKLNDDZD . 0L\DPWR 0 1XUPDPDW 7 2NXGD . 6KLP
FRXGJHFIWE RQN DDFH WXWD WHQ RQDQKH VHLPD, PUS WDO 7-MHK
, QW ~~WVNDQ & RQIHQRQE~~ HOSPODERIV , &6) 3RVWHU \$67
3/\$=\$ +LURVKSDD

> @7 .RQR 0 .DNRRLVKLNDDZD .; 6:XP LGD . 0L\DPWR 7 0XUR
6DRK . *RWR < 6DNXUDED . +RQR \$ LMPRU DW ~~WVNDQ & RQIHQRQE~~
UHHYDEH GUHVRQD ~~WVNDQ & RQIHQRQE~~ SWRWR VVRS, ~~WVNDQ & RQIHQRQE~~
)LOPQGD ~~WVNDQ & RQIHQRQE~~ FUHV , &6)6 3RVWHU \$67(5 3/\$=\$ +LURVKLPD -DSI
6WXGHQW 3RVWHU \$ZDUG

> @7 <RVKLNDDZD 7 .RQR 0 .DNRNL . 6XPLGRK .. 0RVDRRWR
6DNXUDED . +RQR \$ LLOPKU ~~WVNDQ & RQIHQRQE~~ SIXIQRHFFXSR QGFHOWDWH
&RQ*H *D ILOP YLDD ~~WVNDQ & RQIHQRQE~~ SWURVKH ~~WVNDQ & RQIHQRQE~~ DHUHQ
RQ 6ROLG) ~~WVNDQ & RQIHQRQE~~ G 6XRVWHU \$67(5 3/\$=\$ +LURV
> @7HUXR 0DVMXGD\DPWR \$NLR NIXDU D'HYHQRIS ~~WVNDQ & RQIHQRQE~~ PXO
VSLQH ~~WVNDQ & RQIHQRQE~~ DW +L62GDO, ~~WVNDQ & RQIHQRQE~~ SR ~~WVNDQ & RQIHQRQE~~ V6\QFKUVRQRQ 5D
6FLHQ >&3RVWHU +LURVKURDKLPIDYHDSDDQ

> @6 , ~~WVNDQ & RQIHQRQE~~ LWR ~~WVNDQ & RQIHQRQE~~ ER 7 ~~WVNDQ & RQIHQRQE~~ V:K 0DQVXHU .1D ~~WVNDQ & RQIHQRQE~~ WDBB 6 8HGI
+ LWR 6 ,VKLGD R.K 2ND)X<ML*RLWD \R <RVKJLGR \$+ , (LVDNL
.DZDVKLPD < <DQDJL \$,QRV ~~WVNDQ & RQIHQRQE~~ UGSHFUDVRSKRSR ~~WVNDQ & RQIHQRQE~~ HUHG
FKDOFRJHQLGH VXSHUR;QGXFWR 6M ~~WVNDQ & RQIHQRQE~~ UFKHUV
:RUMRS RQ 6\QFKUVRQRQ ~~WVNDQ & RQIHQRQE~~ SRDWHU +LURVKLPD 8
+LURVKLPSSDQ

> @;LDR[LDRJ :D-LDKXD &KHQ 0LQJWLDQN ~~WVNDQ & RQIHQRQE~~ J, JR D ~~WVNDQ & RQIHQRQE~~ QD ROYH Q(V
6FKZLHQLS) 2UEDQLIX 6. ~~WVNDQ & RQIHQRQE~~ RL 6XPLGD 7RPRNL <RVKJLGR .R
1XUPDPDW 7DLFKL 2NXGD .HQ\ 6KLPDGD 0DULR 1RYDN
3'LVH ~~WVNDQ & RQIHQRQE~~ J2UELWDO DQG 6SLDFH ~~WVNDQ & RQIHQRQE~~ MXLYHMG R ~~WVNDQ & RQIHQRQE~~ HSKLQ 1R
6HPLPHWDO + ~~WVNDQ & RQIHQRQE~~ DQ, ~~WVNDQ & RQIHQRQE~~ HVHDUFKHUV :RUNVKRS RQ 6\QF
>&3RVWHU +LURVKURDKLPIDYHDSDDQ

> @O+LURQRVKLQ 2GD +LXVXONL 2ZDZDZDLNLR <DQR 6DWRVKKL
6DVDJDZD (LNH)DELDQ 6FKZLHU .HQ\ 6KLPDGDQ \$NLR
~~WVNDQ & RQIHQRQE~~ 3EPROD\ZVÊKRYH Q NL • KL UOV

+LURV

QVKFKL

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+LURV

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3'LVHQQVOD QJ ZUG 68/IDQ 7H[V R H HG/HUQ YKBU WDPRIHS KLCF FUVVWD
1HZ 7UHQQV LQ 7RSRORJLFDO ,QVXODWUW\ERONDHGGJH9DU
FBUHVSRRQGHQIFH, DQG %(& 3RVWHU \$
+LURVK-LPSSDQ
> @7DNHUX 6KLPDQR <RW D K7LNDFZKLU R R &MID \$NULXDZNDI R G DW
\$NLR .LPXUD 6KLPQMLR U3URDS H3UVDLHV RIQM9, R Q EOXFWHRG PD
6Q 0Q 7H LVPKL QEURZ%(' 1HZ 7UHQQV D Q Q Q V X S R D W B U 9 D U L H W \ D Q
XQLYOHUWADFOIN HGJH FRHUUH V \$ R Q G H Q G %(& 3RVWHU
\$67(5 3/\$=\$ +LURVKLPD -DSDQ

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° v ¥ ¼ ¿ ± Û í • 4“ ÿ Õ á Æ «>'
- > @4Ý,e Â>* 'LDRQG /LJKW 6R&UD -jß ¼ À \$53(6>*q'f œ7Á Ê(œ [
Á C5 Ê"@2A&É Û%Ê'2_6ö M • á î j © Û µ É >&" G +L6 2/É'2 >& ° v
¥ È á ± Û >'
- > @4Ý,e Â>*¼ À \$53(6 | • • d7Á Ê" g Â b0{ >*" G : U œ Û ,]m%Ê'2 >*:
U œ †#Ý 8 S ¼ À (œ •/j \ « Æ á ° ß ½ j « \ b ì % Û § î³ ¿ µ ° á î j b g
B_¥EZ%>& ° v ¥ ¼ í ± Û > ,
- > @4Ý,e Â>*" aæ:Uœ †#Ý 8 S q'f œ7Á Ê(œ >*/\$625-Ñ ¼ î >& ° v
¥ ¼ ¿ ± Û í "@ ö%Ê'2 d>'

>& M+á1n †>'

- > @.D XNL 6XPLGD <X\ID 6DNXUDED .HLV XNDHN IDDD V B NLL7 DRND R KL
.RML 0L\DPWR <RVKLR XGLXUSNLRDLERXVBD R2EMHOYDRQHV L
)HURJWLF +HXRVOHLO \$OO&E \ 6SLQ DQG \$QJOH 5RQROYHG
6\$FWURVFR \$Á#Ý"@#. Û Ó Ø Û j1n † >& ° v ¥ V ± Û í
D1Â ÿ Õ á Æ «>* ¼ ¿ 4" æ#ã >'
- > @4Ý,e Â>* 3DYHXGLQ>¿ Ó>*Q-Öj>* 7LPXU .>: &PHSKIDVFK &RUWJ +RHVFK
5j4B i"@9x 2x _/ <% B X2 b QDQR \$ \$ @#. Û " G ° ± >&
° v ¥ j, † ± Û í ¼ £ ÿ Õ á Æ «>* j, † w>'
- > @5 ;µ Ê œ W Â •] k ;LDR[LQR< .[DM] 7oG... u`#. (œ § Û
µ 3> ;)z \$53(6 | • í - « Û î ° & RQ Q * H Á Ç Ó ± Û µ j ^ Á à » S4 b0{
¥ • "@#. Û " G ° ± >& ° v ¥ j, † ± Û í ¼ £ ÿ Õ á Æ «>*
i, † w>'
- > @ • #ã Á ... Á ¼ Ý,e Â `Ý & ½ Ó % @5 Š U ý 1Â *½ '2] è#è () 6FK Zã #ã 2U
" œ § Û µ 5j4B i"@9x 2x _/ /Dx 6x & X 2 b 9x (0Ž+ \$53(6¥ • "@#. Û "
G ° ± >& ° v ¥ j, † ± Û í ¼ £ ÿ Õ á Æ «>* j, † w>'
- > @0%¼ • È ¿ #ã í È ¿ , - Á " W[µ :XRLWL 0D œ § Û H U á #ã 2< " V#ã
,q ¼ :#8œ*. %¼ #ã,q ..., 4ej <.(* O Ç .(, /ñ - • #ã, /œ 1ç r , ¶ 5 Å
ì î R] á ú - 7g Ó -5 Á R 6 t(nKS ™"g Ü à i • Ý ¥ π ¼ - » 2x _/

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- [12] Kazuki Gotok, Yuya Saito, Yoshio Miura, Ivan Kurniawan, Akiri Chen Zixi, Tajiri Hiroo, Akio Kimura, Kazuhiro Hono, ‘
valencoencitruclrele2FC(Ge)Hneutsaloyroablservedbyhard
rayphotonics’ _____ 2019 9 18-21
_____ ,
- [13] _____
_____ C Mn Ge(Ga) Ge(Ga)
_____ 80 _____ 2019 9
18-21 ,
- [14] _____ C Mn Si _____ 80
2019 9 18-21 ,
- [15] _____ Wang Xiaoxiao _____
C Mn Ge _____ 80 _____ 2019 9 18-
21 ,
- [16] Nurmamat Munisa, Wang Xiaoxiao, Takemoto Hiroko, Y
Kakoki Masaaki, Kono Takashi, Zhang Ke, Kunama Syhaino S o h v
Ko j k u O d a T a i c h i, Kimura Akio _____
dichalcogenide _____ 2019 9 10-13 ,
- [17] _____, _____, _____, _____, _____, _____, _____
_____, _____, _____ C Mn Ge(Ga) Ge(Ga)
2019 _____ 2019 9 10-13 ,
- [18] _____, _____, _____, _____, _____, _____, _____
_____ C Mn Si _____ 2019
2019 9 10-13 ,
- [19] Xiaoxiao Wang, Jiahuan Tang, Mang Mieann, Zhikhova, Igor
Schwieler, Forbang Wu, Khazuki Sumida, Tomoki Yoshikawa, K
Nurmamat, Taichi Okuda, Kenya Shimada, Mario Novak,
“Diselng Orgnidit Splian Texa u Nde as li In idnier Semimetal Hf Si S,”
2019 _____ 2019 9 10-13 ,

[20] X i a o X i a o W a n g, C M n G e 2019 2019

[21] N u r m a m a t M u n g i X i a o W a n g, C h e n J i a h u a, Z h a n g K e, K u m a r S h i v, S c h w i e r, E i k e, 2019 9 10-13

[22] W a n g X i a o X i a o, S h i v K u m a r, E i k e S c h w i e r, A R P E S 2019 2019 9 10-13

[23] E. F. S c h w i e r, L a S x C u 4 O A R P E S 2019 2019 9 10-13

[24] S 2 R u 4 O 2019 9 10-13

[25] J i a h u a C h e n, T l B i - S 2 2019 2019 9 10-13

[26] W u m t i i M a n s u e r H a r d X - r a y c o m p l e x m i s p e c t r o s c o p y I a p h o s p h i d e c h a l c o g e n i d, L a B X (p X e - r S, S n e d u c t o r s, (Z r 2019 9 5-6

[27] X S 2 R u 4 O 2019 9 5-6

[28] E. F. S c h w i e r, L a S x C u 4 O 2019 9 5-6

[29] M. N u r m a m a t, K h A. O K B. T e r e s h c h e n k B 2 I T 2 2019 9 5-6

[30] X i a o X i a o W a n g, J i a h u a C h e n, M T i a n, X i a o a m a M g e o n r s R u b i n o v, E i S c h w i e r, F O r b a n g W u, S k h a z l u c k i S u m i d a, T o m o k i Y o s h i k a w a, K

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[1] _____ Journal of Infrared Spectroscopy and Related Fields, Editor in Chief
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[2] _____ 2018 10 -2020 9

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[1] H. F u z a w a , T. T a k a k i , M. I t o , E. m u r a , S. W a d a , K. N a g a y a , Y. I t o , T. N i c o l a s , Y. K u m o r a k i y D . , S. M. T. e n d h a i l b a n a , D. Y a m a d a , Y. S a k a k i b K. A s a , Y. S. S t a c k , T. i , K. M a m i , T. U m e m o t o , K. K a j i m y a z o p H. S. S t K m e , P J o h n s s o n , M. S. S c h o f f e r , K. G r X - s J . L i u , T e A s g a y S o M d . N o v , K.

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[1] _____ S A C L A

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[2] _____ 2019 K o r e a - J a p a n S t u d e n t a n d V i s i t i n g S t u d e n t s U n i v e r s i t y
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[3] _____ 2018
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[1] H. Anzai, S. Ishihara, M. Hishida, T. Iwata, H. Saito, T. Z. Matsumoto, H. Hirakawa, Y. Ueda, Land Cu K-edge EXAFS spectra of $\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$ and $\text{Cu}(\text{NO}_3)_2 \cdot 2\text{H}_2\text{O}$. *J. Phys. Chem. B* 104:10404-10410 (2000).

- [11] D. O u t s i , H i , K s k u d o , M o h a r a , M t A r H . N a m a t a m e , M . I . a S n a i g n u i c h i T . M i o k a w a : “ I n t e e p l s a p y i h e a t t r i v t i n t d n i s m t t r e i r p e - t y p e c h a r g e - o r b I r 2 T , e l . P h y s . 1 C 2 h e , 2 7 0 4 2 0 1 9 l i d s
- [12] A . P a l , S . G h o s h , A . G . J o s h i , i S l . , K u K a G r u , S t P a a P . S i n g h , V . K . G a r P r a k R a . K h S i g h , H e S c h w i e r , M . S a w a d a , K . S h i m a d a , A . K e G h o s h , A . “ n v e i s g a t o i f m o d e i s m i n - p h o g r a d c a o l u i B t l e i d i s o 2 C d F 6 e t O y n P r R a m a n s p o e p c y t a n d c o i n a i w t h e c o s t n r i k s t r u c t u r e b y X B S a n d X A P h y s . : . C O M a 3 , 1 2 7 5 8 0 2 1 0 p 2 0 1 9 .
- [13] S . M a t s u b a , K . S h i m a d a , M . K a t o h , K . K a w a s e , K . H a r a d a : “ D e s r i n g f o r t h e f u t u r e p l a n o f t H n i C e n J h . e m P h S y s n c l h 3 r 6 C o n f o n B 0 1 2 0 1 5 5 p 2 0 1 9 .
- [14] M . M . O t r o k o v , i d n v I s K i k h , H . B e E n s t m n n n , D . Z Z . u S g A n i e S r v G a B , A . U . B . W l o t e r , A . V . K o r o l e v a , A . M . S h i k i n , M . B l a m o o v , R a e Y u M . H o f V y a z o v s k a y a , S . V . E r e m e e v , Y u . M . K o r o t e e v , V . M r K r u i z g m e I t . R o v , F A m i r m o s v l , M . B . B a b a n l y , N . T . M a m e d a y , e N v , A V . A n b Z u e r r e o v A V A l f K a a t e v , B . B n i e r , E . F . S c h w i e r , S . K u m a r , A i K i j G n D r i a S W . n P t e o t , R . C S c h a t z B K e K r i M e U h m a n n , C . H . M i n , S . M o s e r , T . R . F . P e i x o t o , F . R M . E c h e n i q u e , A . I s a e v a , E . t V i n C h u d l o t o i s : e o r P v r a e n d i n g m a e f t e i c t o p o c l a o l g i i n s N u a l t a 5 1 7 0 6 r , 4 1 6 - 4 2 2 0 1 9 .
- [15] P . K . D a s , D . D i S a n t e , I j V o i k t u C m a i K . , B r F u y e r , A . G y e n i s , B . E . F e l d R . C i a n c i o , s G i . , M o N i a S . P i c o , A . Y a d z a n i o , G e P R . n J a C a v a : “ L a y e d e p e n d e n t q u a n t u m c o r a p d h a o t l i e o s n t a f t e b i n t h e (a o d m a l o u 7 , 1 1 3 5 5 , 2 0 1 6) ” N a t u r e C O m 6 4 8 2 0 1 9 .
- [16] Y . O h t s u b o , Y . Y a m a s h i t a , K . H a g i w a n a k , a S w d , d K e . H a o , r K i F a , n H . k K u m i g a s h i r a , K . M i y a m o t o , T . O k u d a , W . H i r a n a o c E . d g a , t S e K i n f s a m a r i b m h e d a l a) t s n f e a t a t u m e n u C O , 2 2 9 8 2 0 1 9 .
- [17] Y . F e n g , Q . J i a n g , B . F e n g , M . Y a n g , T . X u i W a l E n F X S Y d n w g i , M r A K r . S h i m a d a , H . O . J e h s o m h a k l e e , R Y . T S h i , X . W u , S . X i a o , S . Q i i a c o e , S . p H i e n “ R s p h i g t a t l i o e n e g m t d n r e n t u m d i i m e t c r t i i g o n 2 a N a l t a y m e n u e d o P , 4 7 6 5 i 2 0 1 9 .
- [18] Y . H i k o s a k a , T . K a j e m a s a , M . F w a y a m a , H M e K a n o l e : o “ i C t r o l i n t h u l t r a m i d o a l e c t o d a r e g i m e b y s y n c N r a b , u r e n C 0 4 9 8 8 u 2 0 1 9 .
- [19] I . M a r k o v i c , C . A . H o o l e y , O . J . C l a r k , F . M i a R e z y o , K a Y M . I D c W a e s t , U n d e r w o o d , M . S A . D e y M n , r P g y a d t , K . J . M u r p h y , P . L e F e v j e , i F . I B e r t r V o b o r n i k , S . W u , T . O k u d a , J . A l a r I a p R . D n C o s K n i d a g n “ W e r y s l i - o n s o s p i n - p o l a r e s s e t d a s t u e s N a n t N u b r G e e S C b 0 4 8 5 u 2 0 1 9 .
- [20] P . Z h a n g , n Z g W a W k u . Y j i , Y . I s h o d a n Y a K G i , Y . r S , C . B i a l r l e e , K . d K a u r T . K o n d o , K z Q k i , n K d K , i X . W a n g , C . J i n , J . H u , R . T h o m a l e , K . S u m i M i y a m o t o , T . O k u d a , H . D i n g , G . D . G u , T . T a m e g a i , T . I K t a i w p a l k e a m i , t o p o t a g i s t a t e s i u p e r o n - b h a s t u d o e 1 5 # 1 4 7 2 0 1 9 .
- [21] J . - H . J o u , Y . - T . L i n , Y . - T . S u , W . - C . S o n g , S . K u m a r , D . K . D u b e y , J . - J . S W . Y o u , T . - W . L i a n g : “ P l a u s i b l e d e g r a d g i t i e t m g i n d e i c h d a e n s i ” s , m s

Orga neicct rEolr222231 2019, .

- [22] S. X i a o, De C. tPs, W. L i u, S. Z h a n g, Y. F e n g, W.-H. J i a o, G.-H. C a o, S h i m a d a, ChLo iu,, X. H e: cötEr l c s t r u c t u r e a n d H - T. r H a s s è, d i a g r a P h y s.. 1 0 0 v 0 5 4 5 1 9 p 2 0 1 9 .
- [23] T. K o n o, M. K a k o k i, T. Y o s h i k a w a, X. W a n g, K. S u m i d a, K. M i y a m S a o t h, K. G o t o, Y. S a k u r a b a, K. H o n o, A. K i m u i r t a y: ð E l s e t m a e t n e t s s o C p M n G e æ æ b e y d r e s o n a e n c t t p r h o n t s o p e p c h t y r s o. s c R o e v . 2 0 1 9 0 0, 1 6 5 1 2 0
- [24] X. W a n g, J. C h e n, M. Z. M e e m g k l o v h i I. P. R u s i n o v, E. F. S c h w i e r, F W u, K. S u m i d a, T. Y o s h i k a w a, K. M i y a k m u o d t a S, M i n u a d n o a M a H t E T. O V. C h u l k o v, A. K i m u r n a g “ b D i b s i e t m t l a a n g d l s r p f i a n c t e d x e t r u i m v e e s d - o s f t a u e s m m o r p h i c s e m i P h e y t s a R l e H v f 2 0 5 4 8 ’ 7 7 0 2 0 1 9 .
- [25] H. A n a i, S. I s h i h a o, K. M S h i k a w a, T. I w a z u m i, H. S a t o, T. Z h u a n K. H i r a o k a: “ M c i e x e t d a v t a e l o e f n t h p e o r u a n d e s e Y a k X i C M u g c, C r d, I n, a n d S n): M a g n e t i c s u s c e p t a c o t h i a l n i d t x y, r x a o y n a y s p s o f p r i o n s i c o n P h y s . R e v 1 0 0, 2 4 5 1 2 2 0 1 9 .
- [26] Y.-J. H a o, P. L i u, Y. F e n g, X.-M. M a, E. i F. S, c S h K u m a r, r M C A H u, R. L u, M Z a g, Y. W a n g, Z. H a o n H K Y Z S h a n g N J N M e L i. W u, K. S h i m a d a, C. C h e n, Q. C. L i u: “ G a p a l i c e e D i r a c c o r e g n i t a i c e p t a t t d g i i n s u t a e f R o r y M n. B i R e v 9, 0 4 1 0 3 8 1 0 p 2 0 1 9 .
- [27] M. H o e s c h, L. G a n n o n, K. S r h i t m M. D a W a n, t J s. K a K i m, X. D. Z h u, C. P e t r o “ D i s o r d e r q u e n c h i i n t g y o w f a t v h e i, C h i z y r s t g e t L e 2, 2 7 6 0 1 2 0 1 9 .
- [28] B. F e n g, H. Z h o u, Y. F e n g, H. L u i d u a, S L H C e h t n M E. t F s S c h w i e r, K. S h i M e n g, K. W u: “ S u p e r s t r l u i n t g t o i f d i n d u i d o i n P e h y s i s n s t R l e 2 / 2 L e 1 9 6 8 0 1 6 p 2 0 1 9 .
- [29] B. F e n g, R.-W. Z h a n g, Y. F e n g, B. F u, S. W u, K. M i y a m o t o, S. H e, L. C h T. O k u d a, Y. Y a o: “ D i s c o v l e i m y e o n f i g M l e a y - d i n n y o g h m a d P h ” y, s . t R t e v . L e 1 2 3 1 6 4 0 1 6 p 2 0 1 9 .
- [30] K. F u k u t a n i, R. u S n t g a H S a h J w J e r, K. S h i m a, d J a, S C K I i. K, W. W. Y e o m: “ E l c t r u i n c i a n l g t o f i o t n h i e c e i x n c s u l a t o n N g i r s S o B u m y d s s. t a R t e 2 / 2 0 6 4 0 1 I t a 5 p 2 0 1 9 .
- [31] Y. H u, X. C h e n, S.-T. P e n g, C z l e a l n e, M. M a S u n, M. H a s h i m o t o, D.-H. S c h w i e r, M. A r i t a, T. W a z R K S M i a i m k a i d e a w X.-H. C h e n, Z i-X, S h D e n, A. B a W i d s, J.-F. H e: c “ t S o p p i s e v i d e n c e o f n o r o u g p e i l n i t e t l d o p b e d l s t O P h y s.. t R l e 2 / 3 1 6 4 0 2 2 0 1 9 .
- [32] T. K a n e y a s u, Y. H i k o s a k a, M. F u j i m o t o, H. g w h y o n r h, M e t K a l t a o i h: i n a t o m s u s i n g c r o e s d - e k t l e t e r m a v r i l o y l p e d R a n y e. p a R t e 2 / 3 t s L ” e t t 2 3 3 4 0 1 5 p 2 0 1 9 .
- [33] H. K a w a g u c h i, M. K a n g h u: l “ a O r r h o m e i l t a u n e o l i d r i t e P i r a o g d d W i h e o . E x p . 2 P o h 1 y 9 s, 0 8 3 A 1 0 2 p 2 0 1 9 .
- [34] Y. I z u m i: “ S t l r t u e c m a u t r o a f l h a i s t o n e p r o t e i c e d l i e s m i d e N d A - l d y a m a g s y n c h r o t o i n o n i r r a c d u i l a a r d i c h r o i s m s p e c t r o s c o p p o y n a n e w p i p u z o l u e a ’ h, t u m B e a 2 8 2 0 1 9 i n e n c e 3

[1] T. Okada: “High-efficient spin-resolved topological photonic insulators in a
Synchronous **CR** **Ad** **e** **a**”, *Phys. Rev. Lett.* **113**, 087401 (2014).

- “Reduction of Coulomb repulsion in the d_{xy} orbital of the d² ion in the d_{xy} orbital
resonant hard x-ray photoelectron spectroscopy in the CuO system”
Edoctr System SCS 2019 Okayama, 019.9.23-28, 2
- [13] K. Mori, H. Sano, S. Hato, S. Idetani, K. Tanaka, T. Zhuang, H. K. Matsui,
Arai: “Temperature dependence of the photoemission spectra of the
earthworm Y. M. G. U. in the Conference of the Society of the
2019 SCS 2019 Okayama, 019.9.23-28, 20
- [14] T. Mayumi, Y. Ohashi, M. Sawada: “Development of the X-ray
environment for the International Conference of the
ICSS 19, Hiroshima 019.10.6-11
- [15] K. Hou, W. Mi, M. Sawada: “Biexcitonic structure of the
19th International Conference of the SCS 19 Hiroshima, Japan
2019.10.6-11
- [16] Y. Ohashi, T. Mayumi, M. Sawada: “Magneto-optical effect of the
of h-BN/CN (111)”, The 19th International Conference of the SCS 19
Hiroshima 019.10.6-11
- [17] T. Shimizu, Y. Izumi, K. Matsuno: “Effect of the
apomyoglobin study in the infrared spectroscopy
Japanese Student Workshop Hiroshima 019.11.7-9
- [18] Y. Izumi, K. Matsuno: “Structure analysis of the
from the neglect of the dichroism spectra of the
“Quantum Leap” N. S. J. 019.12.4-5

[1] _____ : X
2019 9 3

[2] _____
2019 2019 10 2

[1] _____ K4/K9 H3
13 2019 5 100%

- [4] _____ 19
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- [5] _____ 19
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- [6] _____ 3
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- [7] _____
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- [8] _____ U V S O R -
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- [9] _____ C s₂ S b C s₃ S b
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-8 3
- [10] _____ 16
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- [11] _____ 16
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- [12] _____ 2019 7 31 -8 3
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- [13] _____ U V S O R 2019
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- [14] R o l a n d S t i a m i n a E i k e F. S c h w i e r C h a n g I l J u n g
S u n g K H a n W o o n g Y e o m T a N i S e 2019
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- [15] N u r m a m a t W u m i g s X a i a o x i a o C h e n J i a h u a
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- [16] _____
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- [17] _____
E i k e F. S c h w i e r N a u r a n g S a i n i
P r (O , F) B i P S r
2019 2019 9 10-13

- [18] _____ ARPES E i k e F. S c h w i e r
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 L a (2 - x) S r x C u O 4
- [19] _____ Y b T G e (T = C r , M n , F e , N i) X
 _____ 2019 2019
 9 10-13
- [20] _____ B a j o i e F w e n g C u a n C h e n
 C h e n g - M a w C h u a m g B S i h a u n J u n g T a i n g C h i a n g
 2019 2019 9 10-13
- [21] _____ & A O J

[30]

_____ N. L. S a i G a i K a s
2019 2019 9 10-13

[31] Koichi Matsuo, Hirotsugu Hira Syntax of Role in War World
2 microglial antigenic stimulation of microglial cells in the
dynamics
2019 9 24-26

[32] _____ 25
H i S O R
2019 10 16-17

[33] _____ 25 H i S O R
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16-17

[34] _____ A R P E S
2019 10 28-30

[35] _____ H i S O R U V S O R 2019
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[36] _____ 2019
2019 11 25-27

[37] _____ 2019
2019 11 25-27

[38] _____ 2019 2019 11 25-27

[39] _____ N e c e s s i t y f o r t h e D M F o T h ? b l e a l i d i a (e d) A r P P e S r i s
3 2019 12 2-3

[40] _____ X 49 S P r i n g - 8
X X

[41] _____ 2020 1 9
W u m i t i M a n s u e r _____

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2020 1 b

[44] _____ X
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[45] _____ E i k e F. S c h w i e r _____ F e S i
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[46] _____
_____ X _____ B i
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[47] _____
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[48] _____ X
_____ C u₂ F₄ r _____ 33
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[49] _____ X
_____ C u A₄ S₃ _____ 33
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[50] _____ V U V-
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[51] _____ T l B₂ i S e _____ J i a h u a C h e n _____ T l B i S
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[52] _____
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[53] _____
_____ L C S _____
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[54] _____
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[55] _____ X
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- [56] _____ 2
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- [57] _____ 33
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- [58] _____ K4 H3
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- [59] F r a n k W i e n _____
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H i S O R

- [1] _____ ; “
 ” 2019 8 26
- [2] _____ ; “ _____ ” 2019
 10 8
- [3] S u i m a n B. S u b r i a t n j a y a U n i v e r s i t a s P a d j a d j a r a n *Herbal medicine and natural products in organic and inorganic chemistry* 2019 p 16
- [4] B e r n a d e t M e t r o g y l L i g h t ; S o u r c e I R _____ -
 / S y n c h r o t r o n a n o p y e c t o r v e c t o r i a t m e d a n s u r e m e n t
 s c h e m a 2019 ” 11 19
- [5] _____ ; “
 ” 2019 11 21
- [6] Z a c h a r y J. U n i v e r s i t a s P a d j a d j a r a n *Herbal medicine, first fruits, and prospects* 2019 p 12 2
- [7] Y o g e n d r a K h u m a r a d A m y o f S c i e n c e a n d T e c h n o l o g y *Herbal medicine and HP-HT synthesis* 2020 p 34”

[8] ; “ ”
2020 1 31

[9] ; “ ”
2020 3 24

[1] I n t e r n a t i o n a l Y o u n g R e s e a r c h e r s W o r k S y n c h r o n i z e d S o i l R e a d i n g
> Z b ” ÂR ApÐ 05 ó4) µ>& ‘fÂ

- [4] 1 2019 6 26
- [5] 2 2019 7 4
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- [7] 30 2019 8 8
- [8] 3 2019 8 22
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- [10] 24 H i S O R 6 2019 9 6
- [11] 3 2019 10 11
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- [14] () 3 2019 12 4
- [15] 3 2019 12 6
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- [17] 6 2019 12 24
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[1] _____ Scitific information member of networkship otins st a nd g co
angle-resolvsed spectroscopy (CORPES)

[2] _____

[3] _____

[4] _____

[5] _____

[6] _____ Member of board in 'BI Spectroscopy and Imaging

[7] _____ Members of the RGDDB Circular Dichroism Data
Technical Advisory Board

[8] _____ Molecular Crystals 2019 6 14-15

[9] _____ Jr.

[10] _____

[11] _____

[1] _____

[2] _____ S P r i n g -8

[3] _____ S P r i n g -8 / S A C L A

[4] _____

[5] _____

[6] _____ U V S O R

[7] _____ V S X

[8] _____ S P r i n g -8

[9] _____ S L i T - J

[10] _____

[11] _____

[12] _____ (J A E A) / (Q S T)

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[2] _____

[3] _____

[4] _____

[5] _____ V G

[6] _____ :

[7] _____ _____

[1]

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[4]

[1] A study on mechanism of hydrogen sulfide adsorption on Bi₂Se₃ phosphat
analysis using hoi Kim

[2] Electronic structure of neilium in Bi₂Se₃ Chien

[3] High-resolution ARPES measurements of Bi₂Se₃ borophene

[4] ARPES study of Bi₂Se₃ Feng

[5] ARPES study of a Dirac semimetal Bi₂Se₃ Feng

10 j

[17] High resolution ARPES study of topological insulators: *MnBi*
MnBi, Chang Liu

[18] Angle resolved photoemission spectroscopy of *Cu₂Te*
Hall, Fautsch, Yu, Zhang

[19] "Spatial resolution of ARPES in *Bi₂Te₃*"
MnBi and *Bi₂Te₃*, Chaoyu Chen

[20] Electronic structure and spin-orbit coupling in *Bi₂Te₃*
Chen

[21] Invariant topological bands in *Bi₂Te₃*
Björk, Feneberg

[22] ARPES study of topological surface states in *Bi₂Te₃*
Hedgcock, P. Bi

[23] Ultrathin films of spin-orbit-influenced metals: Interplay of spin-orbit coupling and magnetism
Munk, Donath

[24] ARPES study of topological surface states in *Bi₂Te₃*
Feneberg

[25] The electronic structure of *Bi₂Te₃*
Kashiyama, Komatsu

[26] ARPES study of non-uniform charge transfer in *Bi₂Te₃*
N. M. P. M. A. N. K.

[27] ARPES investigation of new type of topological surface states in *Bi₂Te₃*
A. S. T. Q. T. A. M. B. A.

[28] Intrinsic topological surface states in *Bi₂Te₃*
S. V. S. R. B. S. T. R. U. R. C. I. U. T. M. Y. Z.

[29] Direct observation of topological surface states in *Bi₂Te₃*
S. N. F. C. E. M. A. R. I. O. N. O. V. A. K.

[30] High resolution ARPES study of topological surface states in *Bi₂Te₃*
Liu

[31] Intrinsic topological surface states in *Bi₂Te₃*
A. S. T. A. R. A. P. H. D. E. R.

[32] Probing the topological surface states in *Bi₂Te₃* by the electron
of the topological surface states in *Bi₂Te₃* by the electron
Friedrich Reinert

[33] High resolution ARPES study of topological surface states in *Bi₂Te₃*
Liu

[1] _____	A			
		42,250	2019	4,940
[2] _____	B			
		18,330	2019	1,430
[3] _____	B			
		4,290	2019	780
				DNA

[4] _____

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4,420

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1,690

[5] _____

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[6] _____

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[1] _____

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	36	82	40
	20	119	22
	66	221	68

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2019	57	5	58	43
2018	64	5	65	46
2017	63	7	64	48
2016	74	6	73	53
2015	71	5	68	37
2014	60	6	61	40

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(C n~~2~~H +1NH3)2M e C 14
n = 2, M e = M n
E u I n 2 A s 2

A L I C E /K
μ

I L C

T m F e 4 C o A 1 7

T m T e

C e B 6

H i S O R B L - ~~IX~~

(C N N)

E r 3 R u 4 A 1 1 2

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F(R)

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B a A 1 2 O 4

B a / S r

24

S m C o 5

25

X X L

26

27

-

G o r ' k o v -

28

G r p a h e n e / C o (0001) / W (110)

29

G e V / T e V

30

31

-

(F e , C o , N i , C u , Z n)

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33

-

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-

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P r I r 2 Z n 20

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37

P r L a 0.9 P r 0.1 V 2 A 1 20

38

Y b C u 5- x A X 1 x

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M a j o r a n a

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C e P t 6 A 1 3

45

A L I C E μ

46

I X P E

X

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G H z

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S P I C A

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Y b C o r ~~20~~

N i

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N b (10)

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A I

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54

X

55

Y b N i 3 A 1 9 L u

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2

57

