

# Publication list

Dr. Zoran Andelkovic

## 2019

29. **Development of the HITRAP cooling trap and the EBIT offline ion source**

*Z. Andelkovic, J. Fischer, F. Herfurth, K. König, D. Neidherr, W. Nörtershäuser, S. Trotsenko, G. Vorobjev*

Hyp. Int. **240** 69 (2019)

28. **The Hyperfine Puzzle of Strong-Field Bound-State QED**

*W. Nörtershäuser, J. Ullmann, L. Skripnikov, Z. Andelkovic, C. Brandau, A. Dax, W. Geithner, C. Geppert, C. Gorges, M. Hammen, V. Hannen, S. Kaufmann, K. König, F. Kraus, B. Kresse, Y. Litvinov, M. Lochmann, B. Maass, J. Meisner, T. Murböck, A.F. Privalov, R. Sánchez, B. Scheibe, M. Schmidt, S. Schmidt, M. Steck, T. Stöhlker, R.C. Thompson, C. Trageser, J. Vollbrecht, A.V. Volotka, C. Weinheimer*

Hyp. Int. **240**, 51 (2019)

27. **Towards laser spectroscopy of  $24\text{Mg}^{+-}$  ions at CRYRING@ESR**

*K. Mohr, A.W.Barasa, Z. Andelkovic, A. Buß, V. Hannen, W. Nörtershäuser, T. Ratajczyk, R. Sánchez*

DOI: 10.1002/xrs.3082, accepted for publication in X-Ray Spectrometry (2019)

26. **Lifetimes and g-factors of the HFS states in H-like and Li-like bismuth**

*V. Hannen, J. Vollbrecht, Z. Andelkovic, C. Brandau, A. Dax, W. Geithner, C. Geppert, C. Gorges, M. Hammen, S. Kaufmann, K. König, Y. Litvinov, M. Lochmann, B. Maass, J. Meisner, T. Murböck, R. Sánchez, M. Schmidt, S. Schmidt, M. Steck, T. Stöhlker, R.C. Thompson, C. Trageser, J. Ullmann, C. Weinheimer and W. Nörtershäuser*

submitted to J. Phys. B: At. Mol. Opt. Phys. (2019)

## 2018

25. **Sympathetic cooling in two-species ion crystals in a Penning trap**

*S. Schmidt, T. Murböck, Z. Andelkovic, G. Birkl, K. König, W. Nörtershäuser, R.C. Thompson, M. Vogel*

J. Mod. Opt. **64**, 5 (2018)

## 2017

24. **High precision hyperfine measurements in Bismuth challenge bound-state strong-field QED**

*J. Ullmann, Z. Andelkovic, C. Brandau, A. Dax, W. Geithner, C. Geppert, C. Gorges, M. Hammen, V. Hannen, S. Kaufmann, K. König, Y. Litvinov, M. Lochmann, B. Maass, J. Meisner, T. Murböck, R. Sánchez, M. Schmidt, S. Schmidt, M. Steck, T. Stöhlker, R.C. Thompson, C. Trageser, J. Vollbrecht, C. Weinheimer and W. Nörtershäuser*

Nature communications **8**, 15484 (2017)

23. **Laser spectroscopy measurement of the 2s-hyperfine splitting in lithium-like bismuth**

*R. Sánchez, M. Lochmann, R. Jöhren, Z. Andelkovic, D. Anielski, B. Botermann, M. Bussmann, A. Dax, N. Frömmgen, C. Geppert, M. Hammen, V. Hannen, T. Kühl, Y. Litvinov, R. Lopez-Coto, T. Stöhlker, R.C. Thompson, J. Vollbrecht, W. Wen, C. Weinheimer, E. Will, D. Winters and W. Nörtershäuser*

J. Phys. B: At. Mol. Opt. Phys. **50** (2017)

22. **Status and outlook of the CRYRING@ESR project**

*W. Geithner, Z. Andelkovic, D. Beck, H. Bräuning, A. Bräuning-Demian, H. Danared, C. Dimopoulou, M. Engström, S. Fedotova, O. Gorda, F. Herfurth, R. Hess, A. Källberg, C. Kleffner, N. Kotovskiy, I. Kraus, M. Lestinsky, S. Litvinov, F. Nolden, A. Reiter, T. Sieber, M. Steck, G. Vorobyev*

Hyp. Int. **238**, 13 (2017)

## 2016

21. **First experimental demonstration of the extraction of low energy beams from the ESR to the CRYRING@ESR**

*S. Litvinov, Z. Andelkovic, D. Beck, A. Braeuning-Demian, S. Fedotova, W. Geithner, R. Hess, F. Herfurth, C. Kleffner, I. Kraus, M. Lestinsky, F. Nolden, M. Steck, G. Vorobyev*

Joint Accelerator Conference Website, RuPAC (2016)

20. **A compact source for singly-charged atomic ion bunches**

*T. Murböck, Z. Andelkovic, G. Birkl, W. Nörtershäuser, S. Schmidt, M. Vogel*

Rev. Sci. Inst. **87**, 043302 (2016)

## 2015

19. **Non-destructive single-pass low-noise detection of ions in a beamline**

*S. Schmidt, T. Murböck, Z. Andelkovic, G. Birkl, W. Nörtershäuser, S. Stahl, M. Vogel*

Rev. Sci. Inst. **86**, 113302 (2015)

18. **Status of deceleration and laser spectroscopy of highly charged ions at HITRAP**  
*Z. Andelkovic, G. Birkl, S. Fedotova, V. Hannen, F. Herfurth, K. König, N. Kotovskiy, B. Maaß, J. Vollbrecht, T. Murböck, D. Neidherr, W. Nörtershäuser, S. Schmidt, M. Vogel, G. Vorobjev, C. Weinheimer*  
 Hyp. Int. **235**, 37 (2015)
17. **Hyperfine Transition in  $^{209}\text{Bi}^{80+}$  - one step forward**  
*R. Sanchez, J. Ullmann, J. Vollbrecht, Z. Andelkovic, A. Dax, W. Geithner, C. Geppert, C. Gorges, M. Hammen, V. Hannen, S. Kaufmann, K. König, Y. Litvinov, M. Lochmann, B. Maaß, J. Meisner, T. Murboeck, W. Noertershaeuser, M. Schmidt, S. Schmidt, M. Steck, T. Stoehlker, R. Thompson, C. Weinheimer*  
 Phys. Scr. 2015, T166, 014021 (2015)
16. **Penning-Trap Experiments for Spectroscopy of Highly-Charged Ions at HITRAP**  
*M. Vogel, Z. Andelkovic, G. Birkl, S. Ebrahimi, V. Hannen, D. von Lindenfels, A. Martin, T. Murboeck, W. Noertershaeuser, W. Quint, S. Schmidt, D. Segal, R. Thompson, J. Mader, C. Weinheimer, M. Wiesel*  
 Phys. Scr. 2015, T166, 014066 (2015)
15. **The HITRAP facility for slow highly charged ions**  
*F. Herfurth, Z. Andelkovic, W. Barth, L. Dahl, S. Fedotova, P. Gerhard, M. Kaiser, O. Kester, H.-J. Kluge, N. Kotovskiy, M. Maier, B. Maass, D. Neidherr, W. Quint, U. Ratzinger, A. Reiter, A. Schempp, T. Stoehlker, H. Vormann, S. Yaramyshev, W. Chen, G. Vorobjev*  
 Phys. Scr. 2015, T166, 014063 (2015)
14. **Beamline for low-energy transport of highly charged ions at HITRAP**  
*Z. Andelkovic, F. Herfurth, N. Kotovskiy, K. König, B. Maaß, T. Murböck, D. Neidherr, S. Schmidt, J. Steinmann, M. Vogel, G. Vorobjev*  
 Nucl. Instr. Meth. Phys. Res. A **795**, 109 (2015)
13. **An improved value for the hyperfine splitting of hydrogen-like  $^{209}\text{Bi}^{82+}$**   
*J. Ullmann, Z. Andelkovic, A. Dax, W. Geithner, C. Geppert, C. Gorges, M. Hammen, V. Hannen, S. Kaufmann, K. König, Y. Litvinov, M. Lochmann, B. Maass, J. Meisner, T. Murböck, R. Sánchez, M. Schmidt, S. Schmidt, M. Steck, T. Stöhlker, R.C. Thompson, J. Vollbrecht, C. Weinheimer and W. Nörtershäuser*  
 J. Phys. B: At. Mol. Opt. Phys. **48**, 144022 (2015)
12. **Laser spectroscopy of the ground-state hyperfine structure in H-like and Li-like bismuth**  
*J. Vollbrecht, Z. Andelkovic, A. Dax, W. Geithner, C. Geppert, C. Gorges, M. Hammen, V. Hannen, S. Kaufmann, K. König, Y. Litvinov, M. Lochmann, B. Maass, J. Meisner, T. Murboeck, W. Nörtershäuser, R. Sánchez, S. Schmidt, M. Schmidt, M. Steck, T. Stöhlker, R.C. Thompson, J. Ullmann and C. Weinheimer*

J. Phys.: Conf. Ser. **583**, 012002 (2015)

## 2014

11. **Observation of the hyperfine transition in lithium-like bismuth  $^{209}\text{Bi}^{80+}$ : Towards a test of QED in strong magnetic fields**

*M. Lochmann, R. Jöhren, C. Geppert, Z. Andelkovic, D. Anielski, B. Botermann, M. Bussmann, A. Dax, N. Frömmgen, M. Hammen, V. Hannen, T. Kühl, Y.A. Litvinov, J. Volbrecht, T. Stöhlker, R.C. Thompson, C. Weinheimer, W. Wen, E. Will, D. Winters, R.M. Sánchez and W. Nörtershäuser*

Phys. Rev. A **90**, 030501(R) (2014)

10. **Laser spectroscopy methods for probing highly charged ions at GSI**

*S. Schmidt, Ch. Geppert, Z. Andelkovic*

Hyp. Int. **227**, 29 (2014)

## 2013

9. **First observation of the ground-state hyperfine transition in  $^{209}\text{Bi}^{80+}$**

*W. Nörtershäuser, M. Lochmann, R. Jöhren, C. Geppert, Z. Andelkovic, D. Anielski, B. Botermann, M. Bussmann, A. Dax, N. Frömmgen, M. Hammen, V. Hannen, T. Kühl, Y.A. Litvinov, J. Volbrecht, T. Stöhlker, R.C. Thompson, C. Weinheimer, W. Wen, E. Will, D. Winters and R.M. Sánchez*

Phys. Scr. **T156**, 014016 (2013)

8. **SpecTrap: precision spectroscopy of highly charged ions-status and prospects**

*T. Murböck, S. Albrecht, Z. Andelkovic, R. Cazan, V. Hannen, R. Jöhren, J. Vollbrecht, S. Schmidt, D. Segal, R. Thompson, M. Vogel, C. Weinheimer, W. Nörtershäuser and G. Birkl*

Phys. Scr. **T156**, 014096 (2013)

7. **Laser cooling of externally produced Mg ions in a Penning trap for sympathetic cooling of highly charged ions**

*Z. Andelkovic, R. Cazan, S. Bharadia, V. Hannen, R. Jöhren, D.M. Segal, R.C. Thompson, M. Vogel, J. Vollbrecht, and W. Nörtershäuser*

Phys. Rev. A **87**, 033423 (2013)

## 2009-2012

6. **HITRAP decelerator and according beam instrumentation**

*F. Herfurth, Z. Andjelkovic, N.P.M. Brantjes, W. Barth, G. Clemente, L. Dahl, S. Fedotova, P. Gerhard, O. Kester, H.-J. Kluge, C. Kozhuharov, M. Maier, D. Neidherr, W. Quint, A. Reiter, T. Stoehlker, G. Vorobyev, S. Yaramyshev*

Joint Accelerator Conference Website, HIAT12 THB05 (2012)

**5. Towards high precision in-trap laser spectroscopy of highly charged ions**

*Z. Andjelkovic, S. Bharadia, B. Sommer, M. Vogel and W. Nörtershäuser*

Hyp. Int. **196**, 81-91 (2010)

**4. Isotope shift measurements in the  $2S_{1/2} \rightarrow 2P_{3/2}$  transition of  $Be^+$  and extraction of the nuclear charge radii for  $^{7,10,11}Be$**

*M. Žáková, Z. Andjelkovic, M. L. Bissell, K. Blaum, G. W. F. Drake, Ch. Geppert, M. Kowalska, J. Krämer, A. Krieger, M. Lochmann, T. Neff, R. Neugart, W. Nörtershäuser, R. Sánchez, F. Schmidt-Kaler, D. Tiedemann, Z.-C. Yan, D. T. Yordanov and C. Zimmermann*

J. Phys. G: Nucl. Part. Phys. **37**, 055107 (2010)

**3. HITRAP - a facility for experiments on heavy highly charged ions and on antiprotons**

*Z. Andjelkovic, W. Barth, G. Birkl, I. Blank, K. Blaum, N.P.M. Brantjes, E. Bodewits, A. Bräuning-Demian, D. Church, L. Dahl, S. Götz, F. Herfurth, R. Hoekstra, O. Kester, H.-J. Kluge, S. Koszudowski, C. Kozhuharov, G. Maero, W. Nörtershäuser, J. Pfister, W. Quint, U. Ratzinger, A. Schempp, D. Segal, A. Sokolov, Th. Stöhlker, R.C. Thompson, J. Ullrich, V. Varentsov, M. Vogel, G. Vorobyev, A. Warczak, M. Weidemüller, C. Weinheimer and D.F.A. Winters*

J. Phys.: Conf. Ser. **194**, 142007 (2009)

**2. Absolute frequency measurements on the  $2S \rightarrow 3S$  transition of lithium-6,7**

*R. Sánchez, M. Žáková, Z. Andjelkovic, B.A. Bushaw, K. Dasgupta, G. Ewald, C. Geppert, H.-J. Kluge, J. Krämer, M. Nothhelfer, D. Tiedemann, D.F.A. Winters and W. Nörtershäuser*

New J. Phys. **11**, 073016 (2009)

**1. Nuclear Charge Radii of  $^{7,9,10}Be$  and the one-neutron halo nucleus  $^{11}Be$**

*W. Nörtershäuser, D. Tiedemann, M. Žáková, Z. Andjelkovic, K. Blaum, M.L. Bissell, R. Cazan, G.W.F. Drake, C. Geppert, M. Kowalska, J. Krämer, A. Krieger, R. Neugart, R. Sánchez, F. Schmidt-Kaler, Z.-C. Yan, D.T. Yordanov, and C. Zimmermann*

Phys. Rev. Lett. **102**, 062503 (2009)