Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Time-Resolved Interatomic Coulomb Electron Capture by Ba^+ through Rb proximity[1] AXEL MOLLE, Inst. for Methods for Mat. Dev. Helmholtz-Zentrum Berlin GmbH, ORIOL VENDRELL, Department of Physics and Astronomy, Aarhus University, Aarhus, Denmark, ANNIKA BANDE, Institute for Methods for Material Development, Helmholtz-Zentrum Berlin GmbH, Berlin, Germany — A time-resolved numerical investigation of the Interatomic Coulomb Electron Capture (ICEC) is presented. In the ICEC process, a species A captures a free electron by long-range energy transfer through Coulomb interaction to a bound electron in a neighbouring species B. From a theoretical perspective, ICEC was first predicted for atoms and molecules through asymptotic approximation [1], and then successfully modelled by time-dependent techniques in low-dimensional systems [2]. From the experimental side, on the other hand, techniques for trapping ultracold ions and atom clouds are advancing. This may enable time-resolved ICEC experiments in the near future. We thus numerically study the dynamics of such an exemplary experiment at ultracold temperatures, with a barium cation trapped in a cloud of rubidium atoms, in order to predict and pave the way for time-resolved ICEC experiments.
[1] Gokhberg / Cederbaum, Phys. Rev. A **82** (2010).
[2] Pont *et al.*, J. Phys. Condens. Matter **28** (2016).

[1]financed by Freigeist Grant No. 89525 and the HZB PhDabroad Programme

Axel Molle
Helmholtz-Zentrum Berlin GmbH

Date submitted: 07 Feb 2018 Electronic form version 1.4