

Abstract Submitted
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The influence of the micromotion on the sympathetic cooling of an ion immersed in an ultracold gas MICHAL KRYCH, ZBIGNIEW IDZI-ASZEK, University of Warsaw — We investigate the influence of ion micromotion in a Paul trap on the sympathetic cooling of an ion immersed in an ultracold gas or a Bose-Einstein Condensate. The motivation for our investigation are recent experiments on hybrid ultracold atom-ion systems. In order to trap an ultracold ion a time-dependent trap is needed. Apart from the main effective harmonic frequency (secular motion) also the so called “micromotion” appears. Its influence on the sympathetic cooling by the ultracold gas has not been calculated nor understood properly yet. Previous experiments performed with hot gases show that the ion can be sympathetically cooled or heated by the gas - depending on the atom-ion mass ratio and interaction strength. Our analytical calculations show that a similar behavior will be present in an ultracold gas.

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