Program & Abstracts
General description of few-body break-up processes at threshold

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In this communication we present a general description of the behavior of fragmentation processes near threshold by analyzing the break-up into two, three and N bodies in steps of increasing complexity. In particular, we describe the effects produced by an N-body threshold behavior in N+1 body break-up processes, as it occurs in situations where one of the fragments acquires almost all the excess energy of the system. Furthermore, we relate the appearance of cusps and discontinuities in single-particle multiply differential cross sections to the threshold behavior of the remaining particles, and apply these ideas to different systems from atomic, molecular and nuclear collision physics. We finally show that, even though the study of ultracold collisions represents the direct way of gathering information on a break-up system near threshold, the analysis of high-energy collisions provides an alternative, and sometimes advantageous, approach.

Three-dimensional fully differential single ionization cross sections for 75 keV p + He collisions

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We have studied fully differential cross sections (FDCS) for single ionization in 75 keV p + He collisions by measuring the recoil-ion momentum and the projectile momentum in coincidence. The measured FDCS are completely dominated by the binary peak while the recoil peak is absent. This is a clear signature of the post-collision interaction between the outgoing projectile and the ejected electron. Furthermore, our continuum distorted wave calculation demonstrates the importance of the projectile-target nucleus interaction. While the shape of the experimental FDCS is well reproduced by this calculation, there are significant discrepancies in magnitude.
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