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Frustrated Coulomb explosion of helium nanodroplets

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Interatomic Coulombic Decay (ICD) is an efficient energy transfer between atoms and molecules. Via ICD, the excess energy of a donor species is transferred to a neighboring acceptor systems which is thus ionized. ICD is a general mechanism, observed in many systems and have a central role in radiation damage as well as in spectroscopical analysis. In the case of helium nanodroplets, ICD takes place after simultaneous ionization and excitation of one helium atom within the cluster. The excited ion transfers its excess energy to another helium atom which is ionized as a result. After the energy transfer, the two ions repel each other due to Coulomb repulsion. We have shown that the subsequent Coulomb explosion of the droplets is hindered by charge hopping processes. I will present ICD, and how to describe it in helium nanodroplets. Finally, I will discuss the observed frustrated Coulomb explosion of helium nanodroplets.

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