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A Review of recent theoretical development for Coulomb explosion and stopping power of energetic molecular ions and clusters in plasmas¹ GUIQIU WANG, Dalian Maritime University, YOUNIAN WANG, Dalian University of Technology — We summarize our recent theoretical study for Coulomb explosion and stopping power of energetic molecular ions and clusters in plasmas. It's an interesting topic because the potential use of cluster ion beams in fusion research. In particular, there exists a promising inertial confinement fusion scheme in which a plasma target is radiated simultaneously by both an intense laser beam and an intense ion beam. In this paper, the emphasis is laid on the dynamic polarization and correlation effects of the constituent ions within the cluster in order to disclose the role of the vicinage effects on the Coulomb explosion and energy deposition of the molecules and clusters in plasma. On the other hand, affecting of a strong laser field on the cluster propagating in plasma is considered, the influence of a large range of laser parameters and plasma parameters on the Coulomb explosion and stopping power are discussed. Furthermore, in order to indicate the effects of different cluster sizes on the stopping power, a comparison is made for hydrogen clusters and carbon clusters. In addition, the deflection of molecular axis for diatomic molecules during the Coulomb explosion are also discussed for the cases both in the presence of laser field and laser free.

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