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Charge state evolution of diatomic molecular ions in different target material[1] GUIQIU WANG, YUJIAO LI, Dalian Maritime University — Charge state is one of the most important aspects in the study of the interaction between ions and solids, such as electron capture, ionization, excitation, as well as the energy deposition of fast ions. These phenomena are closely related to the charge state of incident ions and their evolution in the target. It involves multiple research fields such as Inertial confinement fusion driven by ion beam, material surface modification, and molecular ion structure analysis and so on. Therefore, it is of great significance to study the evolution of the charge state of molecular ions in solid targets In this paper, based on the Brandt-Kitagawa (BK) effective charge model combined with the local dielectric function, the molecular dynamics simulation methods are used to study the oxygen molecular ion and nitrogen molecular ion on several solid targets(Ag, Al, C, and Si) under the framework of the linear dielectric response theory. In particular, the effects of the asymmetric wake effect caused by the electric excitation of the target on the interaction potential, charge state, energy loss and Coulomb explosion of diatomic molecular ion are studied and evaluated.

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