

Dynamical Fragment Formation in CoMD Simulations

Previous experimental results have shown a relationship between fragment alignment and composition in heavy ion collisions. It is proposed that the post-collision excited dinuclear projectile-like-fragment (PLF*) rotates for some time until it dynamically splits, at which point neutron-proton equilibration and rotation would simultaneously cease. This mechanism implies a relationship between these fragments' angular alignment, composition, and the contact time between the heaviest and second heaviest fragments before the PLF* breakup. In order to understand these relationships, Constrained Molecular Dynamics (CoMD) simulations were run using $^{70}\text{Zn}+^{70}\text{Zn}$ collisions at 35 MeV/nucleon. We focus on events with the lighter fragment having $Z=4$, and the heavier fragment having $Z\geq 11$. Visualization tools were developed for event-by-event analysis to better understand the mechanisms predicted in the model. As predicted, correlations between contact time, fragment alignment, and composition were observed.