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Computer simulations on the phase separation of 3D binary complex plasmas KE JIANG, LUJING HOU, ALEXEI IVLEV, YANGFANG LI, HUBERTUS THOMAS, GREGOR MORFILL, Max-Planck-Institute for Extraterrestrial Physics, COMPLEX PLASMA GROUP TEAM — One of the most ubiquitous phenomena in fluid mixtures is phase separation and segregation and it has been studied in many different systems such as colloids, polymer blends and alloys for a few decades, and recently investigated theoretically in binary complex plasmas (BCP), i.e., complex plasma consisting of mixtures of two different particle sizes. Langevin dynamics simulations have been used to investigate the structure and dynamics of a three-dimensional binary complex plasma. We showed that BCP undergoes spinodal decomposition with a positive nonaddivity at low temperature. Pair correlation functions have been evaluated to characterize the structure of the binary complex plasma and to determine the phase separation of the system. The local mole fraction and Kirkwood-Buff integrals on the time evolution were monitored to determine the rate of demixing. Our simulations will help predict the binary complex plasma experiments on board the International Space Station.

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