

Abstract Submitted
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Kinetics of fluid demixing in complex plasmas: Domain growth analysis using Minkowski tensors ALEXANDER BBEL, CHRISTOPH RTH, Deutsches Zentrum fr Luft- und Raumfahrt (DLR); German Aerospace Center; Mnchener Strae 20; 82234 Weling; Germany — The demixing process of a binary complex plasma is analyzed and the role of distinct interaction potentials is discussed by using morphological Minkowski tensor (MT) analysis of the minority phase domain growth in a demixing simulated binary complex plasma. These MT methods are compared with previous results that utilized a power-spectrum method based on the time-dependent average structure factor. It is shown that the MT methods are superior to the previously used method in the sense of higher sensitivity to changes in domain size. By analysis of the slope of the temporal evolution of MT measures qualitative differences between the case of particle interaction with a single length scale compared to particle interactions with two different length scales (dominating long range interaction) are revealed. After proper scaling the graphs for the two length scale scenarios coincide, pointing towards universal behavior. Thus, Minkowski tensor analysis is likely to become a useful tool for further investigation of this (and other) demixing processes. It is capable to reveal (nonlinear) local topological properties, probing deeper than (linear) global power-spectrum analysis, however, still providing easily interpretable results founded on a solid mathematical framework.

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