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Minkowski functionals: Characterizing particle and bubble clusters in turbulent flow DETLEF LOHSE, ENRICO CALZAVARINI, Univ. Twente, MARTIN KERSCHER, LMU Muenchen, FEDERICO TOSCHI, Rome — Even in homogeneous isotropic turbulence particles, drops, and bubbles (all from now on called "particles") do not distribute homogeneously, but *cluster*. Considerable advances in particle tracking velocimetry and in numerics now allow for the acquisition of huge data sets for particle positions and velocities in turbulence. Here we employ, next to the calculation of the Kaplan-Yorke dimension, a method developed in astrophysics for the characterization of galaxy clusters to quantitatively characterize the particle distribution in dispersed turbulent flow, namely by calculating the Minkowski functional. They contain the complete morphological information and sensitively depend on the density ratio between particle and fluid and on the Stokes number, but much less on the degree of turbulence.

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