LFPB Seminar

MAX PLANCK INSTITUTE
FOR DYNAMICS AND
SELF-ORGANIZATION

The role of thermal inertia on the condensational growth of droplets

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The role of thermal inertia of droplets is in the modulation of small-scale turbulence and in the broadening of the droplet size is discussed. A new formulation of the equations for the condensational growth of water droplets, which takes into account the finite thermal relaxation time of droplets, is formulated. Results of direct numerical simulations in homogeneous and isotropic turbulence with zero mean supersaturation in the two-way coupling regime are presented. They show an increase of droplet size variance due to the increased fluctuations in the supersaturation field seen by each particle, which produce a differentiation of the growth conditions, enhanced by the tendence to cluster in regions of high temperature gradients. The role of the large-scale forcing on the statistics is discussed. Perspectives on the impact of thermal inertia in inhomogeneous situations will be discussed, where size broadening is also enhanced by the intermittency of the vapour density and temperature fields.

Friday, December 1st, 2023 at 14:15
MPI-DS, Seminar room 0.79

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