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Large scale accumulation of inertial particles in turbulent channel flow LUCA BRANDT, PHILIPP SCHLATTER, Linne Flow Centre, KTH Mechanics, Stockholm, GAETANO SARDINA, CARLO M. CASCIOLA, Department of Mechanics and Aeronautics,University of Rome "La Sapienza" — Spatially inhomogeneous turbulent flows induce peculiar phenomena on the transport of a dispersed phase of inertial particles. In channel flows the most striking effect is the spatial segregation of particles that may achieve a concentration at the wall largely exceeding that in the bulk. Here we approach the issue by considering direct numerical simulations in a channel seeded with different populations of diluted, tiny particles. The simulations at Re_τ=180 have been performed using the largest domain size so far. The structures found in the fully developed stage of the process show strong spanwise correlations more intense than those found in the corresponding elongated structures of low and high fluid speed. The extremely regular spanwise organization corresponds to a mean spacing of about 120 plus units. The turbulent simulations with an increased size of the numerical box highlight some significant differences in the correlation of particle concentrations. A possible explanation of this feature can be related to large-scale structures of the velocity field, which might carry a considerable amount of energy. Correlations between turbulent events, sweep and ejections, and the particle motion to and from the wall will be also presented.

Dan Henningson
Linne Flow Centre, KTH Mechanics, Stockholm

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