A-priori reconstruction of ideal stochastic forcing for particle motion in turbulent flow MARIA VITTORIA SALVETTI, Dept. Aerospace Engineering, University of Pisa, SERGIO CHIBBARO, D'Alembert Institute, Pierre et Marie Curie University, FEDERICO BIANCO, CRISTIAN MARCHIOLI, ALFREDO SOLDATI, Dept. Energy Technologies, University of Udine — One issue associated with the use of Large-Eddy Simulation (LES) to study the dispersion of small inertial particles in turbulent flow is the accuracy with which particle statistics and concentration can be reproduced. The motion of particles in LES fields may differ significantly from that observed in experiments or Direct Numerical Simulation (DNS) because the force acting on particles is not well estimated when only the filtered fluid velocity is available, and because errors accumulate in time leading to progressive trajectories divergence. We identify herein an Ideal Forcing (IF) such that trajectories of individual particles moving in a-priori LES fields in turbulent channel flow coincide with particle trajectories in a DNS. The objective is to compute PDF and statistical moments of IF to possibly identify a stochastic process from which IF could be extracted and then used as closure model for the particle motion equations.

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