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Statistical model for the orientation of non-spherical particles settling in turbulence K. GUSTAVSSON, University of Gothenburg, J. JUCHA, Ecole Normale Suprieure de Lyon and CNRS, A. NASO, E. LVQUE, Ecole Centrale de Lyon and CNRS, A. PUMIR, Ecole Normale Suprieure de Lyon and CNRS, B. MEHLIG, University of Gothenburg — To understand the dynamics of small particles suspended in turbulent flows is important to shed light on many problems in Natural Sciences and in technology. Using direct numerical simulations and a statistical model, we study the dynamics of small, heavy, spheroidal particles falling in a turbulent aerosol. In the statistical model we replace the flow by a random velocity field which is smooth in both space and time. In this model we can solve the dynamics analytically, allowing us to find the functional dependence of statistical quantities on the relevant particle parameters. Rotational symmetry in the problem is broken due to gravity and due to the non-spherical shape of the particles. We study how this affects the settling velocity and orientational distribution of the particles.

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