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Microstructural Effects in a Fully-Resolved Simulation of 1,024 Sedimenting Spheres[1] LORENZO BOTTO, ZHONGZHEN ZHANG, ANDREA PROSPERETTI[2], Johns Hopkins University — The results of a fully-resolved simulation of 1,024 particles settling under gravity in a periodic domain are described and analyzed. The particle volume fraction is about 13% and the single-particle terminal Reynolds number about 10. Single and two-particle diffusivities are explored in the vertical and horizontal directions and their values related to the anisotropy of the system. Examination of the microstructure reveals that that the formation of nearly-horizontal particle pairs is an important phenomenon affecting the mean settling velocity as well as the velocity fluctuations.

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