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Resolved Simulations of Particulate Shear Flow GEDI ZHOU, Johns Hopkins University, ANDREA PROSPERETTI, University of Houston — This work describes the results of a numerical study of a suspension of thousands of resolved spheres in shear flow carried out by means of the Physalis method. The particle/fluid density ratio is varied between 2 and 5, the volume fraction between 5% and 30% and the particle Reynolds number between 25 and 50. Gravity is disregarded. The results shown include the particle mean free path, the pair distribution function, the particle diffusivity, collision frequency, the mixture stress and others. The mean free path decreases as the particle density is increased. Significant particle layering near the walls occurs with increasing volume fraction, with a strong effect on the velocity distribution of the suspension and the wall shear stress. The collisional contribution to the stress becomes dominant as the particle density ratio and volume fraction increase.

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