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Effect of friction on the rheology of dense suspensions STANY GALLIER, Safran, ELISABETH LEMAIRE, FRANÇOIS PETERS, LAURENT LOBRY, LPMC-CNRS, University of Nice — This work reports three-dimensional numerical simulations of sheared non-Brownian concentrated suspensions using a fictitious domain method. Contacts between particles are modeled using a DEM-like approach (Discrete Element Method), which allows for a more physical description, including roughness and friction. This study emphasizes the effect of friction between particles and its role on rheological properties, especially on normal stress differences. Friction is shown to notably increase viscosity and second normal stress difference $|N_2|$ and decrease $|N_1|$, in better agreement with experiments. The hydrodynamic and contact contributions to the overall particle stress are particularly investigated and this shows that the effect of friction is mostly due to the additional contact stress since the hydrodynamic stress remains unaffected by friction. Simulation results are also compared with experiments and the agreement is improved when friction is accounted for: this suggests that friction is operative in actual suspensions.

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