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Rheological measurements in liquid-solid mixtures ESPERANZA LINARES-GUERRERO, MELANY HUNT, Caltech — In a previous investigation by Koos *et al.* (2012), the torque measurements of mixtures of non-cohesive, neutrally buoyant, relatively large particles (order of mm diameter size) in aqueous glycerine at high shear rates were presented. These measurements showed a linear dependence on the range of shear rates tested ($\dot{\gamma} \approx 1 - 110 s^{-1}$) and a nonlinear dependence on the solid fraction. For this range of shear rates, previous studies have shown a transition from a linear to a nonlinear dependence on $\dot{\gamma}$. However, most of these studies considered smaller particle size (the order of μm) and therefore small Stokes number, or the measurement devices were dominated by secondary flows as shown by Hunt *et al.* (2002). To analyze further this rheology, experiments for suspensions with particle densities higher than the liquid density were performed, which increased the Stokes number. To avoid slip at the walls, the rheometer walls were roughened. At higher Stokes number the particle collisions become important and change the rheology of the suspension. Preliminary results show an increased dependence on Stokes number compared with the earlier study.

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