

Abstract Submitted
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Scaling of boundary stresses in granular mixtures: free surface gravity-driven flows KIMBERLY HILL, BEREKET YOHANNES, St. Anthony Falls Laboratory, Civil Engineering, University of Minnesota, WILLIAM DIETRICH, LESLIE HSU, Earth and Planetary Science, University of California - Berkeley — The ability to predict the stresses particulate mixtures exert on their boundaries is important for many critical natural and industrial applications. For example, predicting boundary stresses due to bouldery debris flows is important for understanding landscape morphology and associated hazard mitigation. Typically, models developed to predict internal and external stresses in these flows contain reference to a particle size and sometimes a maximum packing fraction, neither of which is known for a granular mixture. We find that, while for a mixture sheared in a Couette cell substitutions may be found for both terms, the situation is somewhat more complicated in a free surface flow relevant to debris flows. In the latter case the particle size distribution and the phase of flow is non-uniform in the direction of flow, and both need to be considered for determining the local and global stresses in the system.

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