

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Study of interactions between sediment particles in sheet flow using CFD–DEM RUI SUN, HENG XIAO, Virginia Tech — CFD–DEM simulation is a promising approach in the study of sediment transport. However, the study of sediment transport in sheet flow is still lacking. In this work, a parallelized CFD–DEM solver *sediFoam*, which has been extensively validated, is applied to the study of sediment transport. Numerical simulations of sediment bed of different characteristics under various waves are studied and compared with the results obtained in the literature, including sediment transport flux, solid volume fraction, and movable bed height. The micro-structures (e.g., contact network) and macroscopic solid phase stresses of the sediment bed are analyzed to gain insight into the inter-particle interactions during the transport process. Additionally, the microstructural properties and solid phase stresses in wave-induced sheet flow are compared to those obtained in unidirectional currents, and significant difference is observed.

Rui Sun
Virginia Tech

Date submitted: 01 Aug 2015

Electronic form version 1.4