

DY 4: Invited Talk: Yujie Wang (Shanghai)

Time: Monday 9:00–9:30

Location: DYc

Invited Talk

DY 4.1 Mon 9:00 DYc

X-ray tomography investigation of cyclically sheared granular materials — •YUJIE WANG — School of Physics and Astronomy, Shanghai Jiao Tong University, 800 Dongchuan Road, Shanghai 200240, China

We perform combined x-ray tomography and shear force measurements on a cyclically sheared granular system with highly transient behav-

iors, and obtain the evolution of microscopic structures and the macroscopic shear force during the shear cycle. We explain the macroscopic behaviors of the system based on microscopic processes, including the particle level structural rearrangement and frictional contact variation. Specifically, we show how contact friction can induce large structural fluctuations and cause significant shear dilatancy effect for granular materials, and we also construct an empirical constitutive relationship for the macroscopic shear force.