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Force Network Evolution in a Tilted Granular Bed ASHLEY SMART, PAUL UMBANHOWAR, JULIO OTTINO, Northwestern University — The hierarchy of contacts between grains plays a central role in determining the properties of quasi-static granular materials. Viewed abstractly, the contacts form the connecting edges in a network of interacting nodes where the ‘weight’ of the connection is proportional to the force between contacting grains. Force networks have become a popular method for presenting data produced by experiment and simulation. In this talk we discuss the key changes in the force network for a granular material in an inclined bed. We use particle dynamics to model the granular material as a two-dimensional system of polydisperse disks, and study the evolution of forces, contact angles and network topology as the system approaches the onset of flow. By applying novel network analysis techniques, we gain insight into how granular materials organize, restructure, and ultimately fail under shear.

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