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**Quantitative Comparison of Experiments and Numerics in Granular Materials** JOSHUA DIJKSMAN, Wageningen University , JIE REN, Merck & Co., ROBERT BEHRINGER, Duke University, LENKA KOVALCINOVA, LOU KONDIC, New Jersey Institute of Technology, MIRO KRAMAR, KONSTANTIN MISCHAIKOW, Rutgers University — It is challenging to experimentally probe the microstructure of sheared granular media. Comparisons of numerical results to experiments are thus rare. We present a direct match of experimental and discrete element method results on a sheared two dimensional granular system. We compare the micro and mesostructural properties of the packing using several different metrics, among which measures that quantify the role of the force network topology. We find a quantitative match in the experimental and numerical approaches, and our results surprisingly indicate that the number of rattlers in the packing is a robust indicator of the mechanical and topological composition of the packing.

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