1115-70-325 **Lenka Kovalcinova*** (lk58@njit.edu), 323 Martin Luther King Blvd., Cullimore Hall 208, Newark, NJ 07102, and **Miro Kramar**, **Joshua A Dijksman**, **Jie Ren**, **Robert P Behringer**, **Konstantin Mischaikow** and **Lou Kondic**. *Importance of Topological Measures in Describing Sheared Granular Systems.*

Granular systems are usually analyzed using either experimental techniques or numerical simulations. There is a lack of studies that would directly compare the two approaches. Here, we present such a comparison for a granular system composed of photoelastic disks placed on a plane confined within a rectangular box. In particular, we use the topological techniques on both sets of (experimental and numerical) results. The granular system is linearly sheared up to a maximum strain of 27%. We extract complete information about force networks and use standard measures such as pressure, system anisotropy and inter-particle contact dynamics to characterize their evolution during the shear. For most of the considered measures, we find good agreement between simulations and experiments. However, this is not the case for topological measures - Betti numbers B_0 and B_1. We find that Betti numbers are able to pick up the additional noise in experiments that could not be found using standard measures. Once we artificially add a noise to numerical data, B_0 and B_1 agree for both experiments and simulations, while the standard measures are not qualitatively affected by this change.

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