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Impact of projectiles of different geometries on dry granular media using DEM simulations SPANDANA VAJRALA, HOSAIN BAGHERI, HEATHER EMADY, HAMID MARVI, Arizona State Univ, PARTICULATE PROCESS AND PRODUCT DESIGN GROUP TEAM, BIRTH LAB COLLABORATION — Recently, several studies involving numerical and experimental methods have focused on the study of impact dynamics in both dry and wet granular media. Most of these studies considered the impact of spherical projectiles under different conditions, while representative models could involve more complex shapes. Examples include such things as an animals foot impacting sand or an asteroid hitting the ground. Dropping different shaped geometries with conserved density, volume and velocity on a granular bed may experience contrasting drag forces upon penetration. This is the result of the difference in the surface areas coming in contact with the granular media. Therefore, this work will utilize three-dimensional Discrete Element Modelling (DEM) simulations to observe and compare the impact of different geometries like cylinder and cuboid of same material properties and volume. These geometries will be impacted on a loosely packed non-cohesive dry granular bed with the same impact velocities where the effect of surface area in contact with the granular media will be analyzed upon impact and penetration.

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