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Shock wave interactions in granular flows. AQIB KHAN, SHIVAM VERMA, YASH JAISWAL, YAZUR GUPTA, RAKESH KUMAR, SANJAY KUMAR, Indian Institute of Technology Kanpur — Due to frictional and collisional dissipation, granular flows become supersonic at velocities of the order of 1 m/s and exhibit shock waves in day-to-day applications and in landslides and avalanches. In the present work the phenomenon of shock-shock interactions is investigated by performing experiments in gravity driven rapid granular streams produced in a glass channel of width 300 mm and height 5 mm. An array of triangular wedges are placed inside the channel in close proximity. The shock waves formed on the wedges interact and results in the formation of structures which were never observed before. Due to complex dynamics involved in granular collisions a central streak of concentrated grains is formed which becomes unstable and starts oscillating to and fro around the wedges under specific experimental conditions. The instability is observed for the first time and is unique to granular shocks as no such flow feature exist in gas dynamic shock waves. A detailed investigation is being carried out to explore the underlying mechanism of these instabilities for parameters that cover a wide range of applications.

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