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Dynamical Properties of the Triangular Bouncer[1] MATTHEW HOLTFRERICH, Northern Arizona University, BRUCE MILLER, Texas Christian University — This poster presents research on the dynamical properties of a Fermi bouncer with a triangular driving function using numerical simulation. A Fermi bouncer consists of a mass confined to move in one dimension that bounces on an oscillating floor. It will be shown that, for the elastic case of this bouncer, Fermi acceleration and stability islands exist. Periodic and quasiperiodic motion can be found with the exception of period 1 motion. The elastic version of the bouncer is a one parameter system. When the parameter's value is changed, the behavior of the system can change drastically. However, if the collisions of the system are inelastic, the system becomes a two parameter system that can change its behavior as either parameter is varied. Here, the new parameter arises from the velocity dependence of the coefficient of restitution. As in the elastic case, the inelastic case shows stable islands representing periodic and quasiperiodic motion. Not surprisingly, Fermi acceleration does not occur. An interesting observation is that, when the new parameter is varied, islands can be created or destroyed and complex patterns arise in the island structure.

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