

# Bouncing trimer, bouncing droplet: bouncing modes

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The bouncing ball on a vibrating surface is among the simplest systems that exhibit chaotic features. This problem involves non linear behaviours such as period doubling, orbits, and transition to chaos, that are still far from being exhaustively investigated. The bouncing ball is often considered as a point particle, and we may wonder how a more complex item bounces on the vibrating surface. This communication presents some experiments in which degrees of freedom are progressively added to the bouncing item. First, we have studied objects constituted by two or three linked centimetrical beads (they are called dimer and trimer), that may translate and rotate. Then, we introduced the deformation by studying the dynamics of a bouncing droplet on a high viscous silicone oil bath. In both cases, exotic bouncing modes can be observed: self-propulsion for dimer, rotation and period-3 for trimer, rolling droplets, double emulsification,... Experimental and simulation movies will be shown for both studies.