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Energy bursts in shallow granular systems[1] NICOLÁS MUJICA, NICOLÁS RIVAS, SUOMI PONCE, Departamento de Fisica, FCFM, Universidad de Chile, BASILE GALLET, Laboratoire de Physique Statistique, Ecole Normale Superieure, DINO RISSO, Departamento de Fisica, Universidad del Bio-Bio, RODRIGO SOTO, PATRICIO CORDERO, Departamento de Fisica, FCFM, Universidad de Chile — In a mixture of two species of grains of equal size but differing by their mass, placed in a vertically vibrated shallow box, there is spontaneous segregation. Once the system is at least partly segregated, energy bursts take place: the horizontal kinetic energy of the heavy particles, that normally is small, suddenly increases. An explanation is provided based on the existence of a fixed point for an isolated particle bouncing with only vertical motion between the top and bottom walls. Energy bursts occur when the large energy stored in the vertical motion is partly converted into horizontal energy through a chain reaction of collisions between heavy particles. Depending on the experimental or numerical parameters and initial conditions, the energy bursts can occur either randomly or rather periodically in time.

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