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**Switch of states of a short chain in response to vibrations** YU-CEN SUN, JUNG-REN HUANG, National Taiwan Normal University, Institute of Physics, CHIAO-YU TAO, JIH-CHIANG TSAI, Academia Sinica, Institute of Physics — We study experimentally the dynamics of a short ball chain confined in a quasi-2D vertical channel under different vibrational strengths(VS). For a substantial range of VS, the chain maintains period-1 bouncing with the channel, but also undergoes transitions from a uniform response to various states of excitations as VS increases. In the transitional zone, we find that the unexcited and excited states exhibit bistability and switch spontaneously at fixed values of VS. This coexistence of different states explains the stocastic switch of ratcheting behaviors we reported previously in Phys. Rev. Lett. 112, 058001 (2014) where a spatial gradient of vibration is imposed.

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