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**Emergence of Chaos in nano-electromechanical shuttles with hard-wall collision: Nonanalytic charge transport**[1] HEE CHUL PARK, Korea Institute for Advanced Study, KANG-HUN AHN, Department of physics, Chungnam National University — We develop a theory for charge transport in nano-electromechanical shuttles in the presence of hard-wall collision. We show that, in certain regimes, the time-averaged charge current is not predictable and is not an analytic function of applied voltage. The rectified electric current and its non-analyticity emerge from a non-Markovian process in the presence of the hard-wall collision, which causes chaotic motion of the shuttle.

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Hee Chul Park
Korea Institute for Advanced Study

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