

Abstract Submitted  
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**Spontaneous symmetry breaking in two coupled nanomechanical electron shuttles**<sup>1</sup> CHULKI KIM, University of Wisconsin-Madison, Physics, JONGHOO PARK, ROBERT BLICK, University of Wisconsin-Madison, Electrical & Computer Engineering — We present spontaneous symmetry breaking in two coupled nanomechanical electron shuttles. The electron shuttles are realized as silicon nanopillars and placed between two capacitor plates in a homogeneous electric field. Instead of being mechanically coupled through a spring they exchange electrons, i.e., they shuttle electrons from the source to the drain capacitor plate. The nonzero dc current through this system by external ac excitation is caused via dynamical symmetry breaking. The oscillation frequencies of the shuttling system are mode locked to the applied voltage frequency.

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