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Coulomb Blockade in a Field Emitting Freely Suspended Island CHULKI KIM, Physics, University of Wisconsin-Madison, HYUN S. KIM, Electrical & Computer Engineering, University of Wisconsin-Madison, HUA QIN, Suzhou Institute of Nano Tech and NanoBionics, ROBERT H. BLICK, Electrical & Computer Engineering, University of Wisconsin-Madison — We observe staircase currentvoltage characteristics from an isolated nanomechanical island. The island is fixed by  $CF_2$  connections, which makes the structure suspended 1m above  $SiO_2$ . The noteworthy difference to the "orthodox" single electron transistors is the fact that we observe Coulomb blockade in conjunction with field emission. We can trace and reproduce the transition from staircase in the high bias regime. A theoretical model based on field emission current reproduces the experimental data. The full profile of the current-voltage measurement shows the transition from Coulomb staircase current to island field emission current.

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