Quantum ratchet using a delta kicked accelerator VIJAYASHANKAR RAMAREDDY, Physics Department, Oklahoma State University, ISHAN TALUKDAR, GIL SUMMY, Oklahoma State University, ITZHACK DANA, Minerva Center and Department of Physics, Bar-Ilan University, Ramat-Gan 52900, Israel — A Quantum ratchet is a directed transport of particles in a spatially periodic system arising from the asymmetry between the initial distribution and the spatially periodic potential. A quantum δ-kicked rotor has already been utilized to realize a ratchet [1]. When a quantum δ-kicked accelerator is used instead of a kicked rotor, the ratchet acceleration is found to be generally suppressed [2]. Furthermore the ratchet arises only for special values of the acceleration. We use accelerated standing wave pulses on an atomic state prepared with a Bragg pulse on a BEC to realize the δ-kicked accelerator and to study the ratchet. [1]I. Dana et. al., Phys. Rev. Lett. 100, 024103 (2008). [2]I. Dana et. al., Phys. Rev. E 76, 015201(R) (2007)

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Date submitted: 01 Feb 2008   Electronic form version 1.4