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Time-Correlated Soliton Tunneling in Density Waves JOHN H. MILLER, ASANGA IROSHAN WIJESINGHE, ZHONGJIA TANG, ARNOLD M. GULOY, University of Houston — In the quantum sine-Gordon model of a pinned charge or spin density wave, the electrostatic energy generated by charged soliton domain walls leads to a Coulomb blockade threshold electric field for quantum soliton-antisoliton pair creation. This field can be much smaller than the classical depinning field, since the quantum instability occurs as soon as the formerly lowest energy potential well rises to become a metastable well, or "false vacuum." The analogy to time-correlated single electron tunneling and comparison to recent experimental results, as well as broader implications of the proposed tunneling process, are briefly discussed. This work was supported by the State of Texas though the Texas Center for Superconductivity at the University of Houston and the Norman Hackerman Advanced Research Program, and by NIH R21CA133153 and ARRA supplement 3R21CA133153-03S, and by the Robert A. Welch Foundation, and DoE Basic Energy Sciences.

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