

Abstract Submitted  
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**Collapse and Revival for Double-Well Superlattices<sup>1</sup>** LEI JIANG, EITE TIESINGA, Joint Quantum Institute, University of Maryland and National Institute of Standards and Technology, PHILIP JOHNSON, Department of Physics, American University — Collapse and revival experiments with ultracold atoms in single-well optical lattices are a great demonstration of matter-wave interference. In fact, this interference could be used to measure the interaction strength between atoms. Experiments nowadays have the possibility to form double-well superlattices as well. Here, we discuss theoretically the physics of collapse and revival for double-well superlattices. Different parameter regions of lattice depth as well as tilt between the two wells have been explored focusing on the timescales in which lattices need to be deformed such that unwanted excitations are avoided. We also derive effective multi-body interactions in the double well system.

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