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Ferroelectricity induced by interatomic magnetic exchange interaction CHUNGANG DUAN, Key Laboratory of Polar Materials and Devices, Ministry of Education, East China Normal University, XIANGANG WAN, Department of Physics and National Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, China, HANG-CHEN DING, Key Laboratory of Polar Materials and Devices, Ministry of Education, East China Normal University, SERGEY Y. SAVRASOV, Department of Physics, University of California — Multiferroics, where two or more ferroic order parameters coexist, is one of the hottest fields in condensed matter physics and materials science. To search multiferroics, currently most researches are focused on frustrated magnets, which usually have complicated magnetic structure and low magnetic ordering temperature. Here, we argue that actually simple interatomic magnetic exchange interaction already contains a driving force for ferroelectricity, thus providing a new microscopic mechanism for the coexistence and strong coupling between ferroelectricity and magnetism. We demonstrate this mechanism by showing that even the simplest antiferromagnetic (AFM) insulator MnO, can display a magnetically induced ferroelectricity under a biaxial strain.

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