Magnetization dynamics in exchange coupled antiferromagnet spin superfluids[1] YIZHOU LIU, Department of Electrical and Computer Engineering, Univ of California - Riverside, YAFIS BARLAS, Department of Physics and Astronomy, Univ of California - Riverside, GEN YIN, Department of Electrical and Computer Engineering, Univ of California - Riverside, JIADONG ZANG, Department of Physics and Material Science Program, University of New Hampshire, ROGER LAKE, Department of Electrical and Computer Engineering, Univ of California - Riverside — Antiferromagnets (AFMs) are commonly used as the exchange bias layer in magnetic recording and spintronic devices. Recently, several studies on the spin transfer torque and spin pumping in AFMs reveal much more interesting physics in AFMs. Properties of AFMs such as the ultrafast switching within picoseconds and spin superfluidity demonstrate the potential to build AFM based spintronic devices. Here, we study the magnetization dynamics in an exchange coupled AFM systems. Beginning from the Landau-Lifshitz-Gilbert equation, we derive a Josephson-like equation for the exchange coupled system. We investigate the detailed magnetization dynamics by employing spin injection and spin pumping theory. We also propose a geometry that could be used to measure this magnetization dynamics.

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