

Abstract Submitted  
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**All-magnonic spin-transfer torque and domain wall propagation**<sup>1</sup> X.R. WANG, P. YAN, X.S. WANG, The Hong Kong University of Science and Technology — In this talk, we will discuss the spin-transfer torque (STT) between magnons and magnetic domain wall (DW). It is found that a spin wave passes through a transverse magnetic DW in a magnetic nanowire without reflection. A magnon, the quantum of the spin wave, carries opposite spins on the two sides of the DW. As a result, there is a spin angular momentum transfer from the propagating magnons to the DW. This magnonic STT can efficiently drive a DW to propagate in the opposite direction to that of the spin wave. In comparison with the electronic STT, the energy consumption is much lower when the magnonic STT is used to drive a DW propagating at a useful velocity. Since this STT does not require any itinerant electrons, it opens a door of using magnetic insulators like YIG in spintronics devices. One extra benefit of using magnetic insulators is the low damping coefficient so that it should further lower the energy consumption and increase operation efficiency.

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