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Antiferromagnetic domain wall as spin wave polarizer JIN LAN, WEICHAO YU, JIANG XIAO, Department of Physics and State Key Laboratory of Surface Physics, Fudan University, Shanghai 200433, China — Spin waves are collective excitations of local magnetizations that can effectively propagate information even in magnetic insulators. In antiferromagnet, spin waves are endowed with additional polarization freedom. Here we propose that the antiferromagnetic domain wall can act as a spin wave polarizer, which perfectly passes one linearly polarized spin wave while substantially reflects the perpendicular one. We show that the polarizing effect lies in the suppression of one linear polarization inside domain wall, in close analogy to the wire-grid optical polarizer. Our finding opens up new possibilities in magnonic processing by harnessing spin wave polarization in antiferromagnet.

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