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Spin wave scattering in the ferromagnetic cross[1] ALEXANDER KOZHANOV, UC Santa Barbara, CA, USA, DOK WON LEE, Stanford University, SHAN X. WANG, Stanford University, Stanford, CA, USA, AJEY JACOB, Intel Corp., S. JAMES ALLEN, UC Santa Barbara, CA, USA — Small scale magnetostatic wave devices are potentially important for on-chip filters for communication systems and more exotic gated spin wave devices. We describe experimental results that measure spin wave scattering in the thin film CoTaZr ferromagnetic cross. We fabricated the CoTaZr cross on the Si/SiO_2 wafer. Shorted coplanar waveguides placed over the cross arms were used to excite and detect the spin waves. Spin waves were excited in one of the arms of the cross. Scattered spin waves were detected in the other 3 arms with use of the vector network analyzer (frequency range 0-20GHz, in-plane magnetic fields 0-2000 Oe). Measurements of the fabricated structure show a strong dependence of the spin wave scattering direction and scattered spin wave amplitude on the external magnetic field amplitude and on the angle at which the field is applied. We discuss effect of biasing magnetic fields on the spin wave scattering and approaches to an effective spin wave switch based on the fabricated structure.

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