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Studying Kittel-like modes in a 3D YIG disk using Torque-mixing Magnetic Resonance Spectroscopy FATEMEH FANI SANI, JOSEPH LOSBY, Univ. of Alberta, Department of Physics and National Institute for Nanotechnology, DYLAN GRANDMONT, Univ. of Alberta, Department of Physics, ZHU DIAO, Univ. of Alberta, Department of Physics and National Institute for Nanotechnology, MIRO BELOV, National Institute for Nanotechnology, JACOB BURGESS, SHAWN COMPTON, Univ. of Alberta, Department of Physics and National Institute for Nanotechnology, WAYNE HIEBERT, DOUG VICK, National Institute for Nanotechnology, KAVEH MOHAMMAD, ELHAM SALIMI, GREGORY BRIDGES, DOUGLAS THOMSON, Electrical and Computer Engineering, University of Manitoba, MARK FREEMAN, Univ. of Alberta, Department of Physics and National Institute for Nanotechnology — We report a study of ferrimagnetic resonance in a mesoscopic, single-crystalline YIG disk using torque-mixing magnetic resonance spectroscopy (TMRS). The Kittel model for magnetic resonance is a touchstone in measuring fundamental magnetic properties for magnetic films, which does not significantly depend on the film size. In 3D structures, ladders of confined resonance modes are observed, and these can exhibit the non-monotonic evolution of frequency with field familiar from Kittel modes. TMRS is a tool uniquely suited for observing this physics in individual 3D structures, on account of its combination of high sensitivity and broadband capability coupled with fine frequency resolution.

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