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Field dependence of magnetic order and excitations in the Kitaev candidate alpha-RuCl3[1] ARNAB BANERJEE, Quantum Condensed Matter Division, Oak Ridge National Laboratory, PAULA KELLEY, Material Science and Technology Division, Oak Ridge National Laboratory, BARRY WINN, ADAM ACZEL, MARK LUMSDEN, Quantum Condensed Matter Division, Oak Ridge National Laboratory, DAVID MANDRUS, Material Science and Technology Division, Oak Ridge National Laboratory, STEPHEN NAGLER, Quantum Condensed Matter Division, Oak Ridge National Laboratory — The search for new quantum states of matter has been one of the forefront endeavors of condensed matter physics. The two-dimensional Kitaev quantum spin liquid (QSL) is of special interest as an exactly solvable spin-liquid model exhibiting exotic fractionalized excitations. Recently, alpha-RuCl3 has been identified as a candidate system for exhibiting some aspects of Kitaev QSL physics. The spins in this material exhibit zig-zag order at low temperatures, and show both low energy spin wave excitation arising from the ordered state as well as a continuum excitation extending to higher energies that has been taken as evidence for QSL relate Majorana fermions. In this talk, we show that the application of an in-plane magnetic field suppresses the zig-zag order possibly resulting in a state devoid of long-range order. Field-dependent inelastic neutron scattering on single-crystal shows a remarkable effect on the excitation spectrum above the critical field.

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