

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Spin Ice: Magnetic Excitations without Monopole Signatures using Muon Spin Rotation SARAH DUNSIGER, Physik Department, Technische Universitaet Muenchen, D-85748 Garching, Germany, MICHEL GINGRAS, Department of Physics and Astronomy, University of Waterloo, Waterloo, Ontario, N2L 3G1, Canada, GRAEME LUKE, Department of Physics and Astronomy, McMaster University, Hamilton, Ontario L8S 4M1, Canada, YASUTOMO UEMURA, Department of Physics, Columbia University, New York, New York 10027, USA — Theory predicts the low-temperature magnetic excitations in spin ices consist of deconfined magnetic charges, or monopoles. A recent transverse-field (TF) muon spin rotation (μ SR) experiment [S T Bramwell *et al*, Nature **461**, 956 (2009)] reports results claiming to be consistent with the temperature and magnetic field dependence anticipated for monopole nucleation – the so-called second Wien effect. We demonstrate via a new series of μ SR experiments in $\text{Dy}_2\text{Ti}_2\text{O}_7$ that such an effect is not observable in TF μ SR. Rather, as found in many highly frustrated magnetic materials, we observe spin fluctuations which become temperature independent at low temperatures, behavior which dominates over any possible signature of thermally nucleated monopole excitations.

Sarah Dunsiger
Physik Department, Technische Universitaet Muenchen,
D-85748 Garching, Germany

Date submitted: 28 Nov 2011

Electronic form version 1.4