Monopole and Dirac string constrained Dynamics in Spin Ice LU-DOVIC JAUBERT, PETER HOLDSWORTH, Ecole Normale Superieure de Lyon

— Since its discovery approximately 10 years ago [1], spin ice has proved to be an abounding source of exotic collective phenomena, in particular long-range dipolar correlations and unconventional phase transitions. But its most impressive property is undoubtedly the occurrence of 3d fractionalisation through excitations out of its topological ground state, behaving like effective magnetic monopoles [2]. I shall present an experimental signature of their influence in magnetic relaxation measurements for a spin ice material Dy$_2$Ti$_2$O$_7$ [3] and show that the observed low temperature dynamical slow down can be explained quantitatively by the Coulomb interactions between monopoles and the overlapping of Dirac strings filling the quasiparticle vacuum [4].