Exact Diagonalization Study of the Heisenberg Anisotropic Triangular Model Using Twisted Boundary Conditions

MISCHA THESBERG, ERIK S. SORENSEN, McMaster University — The anisotropic triangular model, which is believed to describe materials such as Cs$_2$CuCl$_4$ and Cs$_2$CuBr$_4$, is dominated by incommensurate spiral physics and is thus extremely resistant to numerical analysis on small system sizes. In this talk we will discuss new exact diagonalization work using twisted boundary conditions to study the phase diagram of this model. With these boundary conditions we are able to extract the inter- and intra-chain ordering q-vectors for the $\frac{J'}{J} < 1$ region, as well as identify a phase transitions at $\frac{J'}{J} \sim 0.50/0.88$ (depending on finite system geometry). We also explore the nature of the two phases.