Study of dipolar many-body system in a one-dimensional zig-zag chain NIRAJ R. GHIMIRE, SUSANNE F. YELIN, Univ of Connecticut - Storrs — The goal is to understand the many-body properties of a one-dimensional zig-zag chain of a fixed number of classical dipolar spins. This is a system that could potentially be modeled by ultracold polar molecules, and be extended such that topological quantities in triangular or hexagonal lattices can be studied. In order to achieve this, we use the density-matrix renormalization group (DMRG) method and find the ground state of the spin $S = 1/2$ model. For this purpose, we will take into account nearest-neighbor (NN) and next-nearest-neighbor (NNN) hopping and interactions which can be expressed as functions of angles between the dipoles.

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Date submitted: 27 Jan 2016   Electronic form version 1.4