Phase diagram of the anisotropic two-dimensional bilinear bi-quadratic spin-1 Heisenberg model

CHRISTOPH PUETTER, MICHAEL LAWLER, HAE-YOUNG KEE, Department of Physics, University of Toronto, Toronto, Canada M5S 1A7 — The anisotropic bilinear biquadratic Heisenberg model on a square lattice has been proposed to exhibit deconfined critical phenomena (DCP) based on QMC simulations and effective field theoretical studies [1, 2]. We investigate the phase transitions of the model using slave boson representation. Our mean field approach suggests a first order transition between the nematic and the disordered regime except at the tricritical SU(3) symmetric point. We will also discuss the relevance of our results to the DCP.