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2d N=(2,2) SYM in the machine

Thursday 27 November 2008 14:15 (1 hour)

We numerically studied supersymmetric Ward-Takahashi identities ("PCSC" relation) in Sugino's lattice formulation of the two-dimensional N=(2,2) supersymmetric Yang-Mills theory with a scalar mass term. We obtained a clear evidence that full supersymmetry is restored in the continuum limit of this lattice model. This is a firm demonstration of, for the first time to our knowledge, realization of supersymmetry in lattice gauge theory. As physical application, we numerically observed that certain correlation functions related by supersymmetry exhibit a power-like behavior (which implies the absence of mass gap) and the static potential between probe charges in the fundamental representation is linearly-rising. The latter confining behavior appears distinct from a theoretical conjecture made in the '90s by Armoni, Frishman and Sonnenschein, although the static potential for larger distance has to be systematically explored to conclude real asymptotic behavior. This presentation is based on collaboration with Issaku Kanamori.

Presenter: Dr SUZUKI