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Lattice Non-Linear Sigma Model on the Supersphere

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The 2D $O(N)$ non-linear sigma models are exactly solvable theories and, on the lattice, they have many applications from statistical mechanics to QCD toy models. In this talk, I will consider a particular generalization of the $O(N)$ model, i.e. the non-linear sigma model on the supersphere. The global symmetry group of this model – the $OSp(N+2M|2M)$ supergroup – mixes bosonic and fermionic degrees of freedom, hence the sigma model can be thought of as a toy model for string worldsheet theories with target space supersymmetry. In this talk, I will describe the non-linear sigma model on the supersphere, its discretization on the lattice, its renormalization properties, and the relation between this model and its non-supersymmetric equivalent. I will also present our strategy for numerical simulations and some preliminary numerical results.

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