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Phase structure of the $N = 1$ supersymmetric Yang-Mills theory at finite temperature

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The behaviour of supersymmetric theories at finite temperatures differs from that of other theories in certain aspects. Due to the different thermal statistics of bosons and fermions, supersymmetry is explicitly broken for any non-zero value of the temperature. We study the $N=1$ supersymmetric Yang-Mills theory on the lattice at finite temperatures. This model is the simplest supersymmetric extension of the pure gauge sector of QCD, describing the interactions between gluons and their fermionic superpartners, the gluinos. At zero temperature the theory confines like QCD, and chiral symmetry is spontaneously broken. At high temperatures, deconfinement and chiral symmetry restoration are expected to take place, but it is not known whether these two phase transitions coincide or not. First results on this topic, obtained in numerical simulations, will be presented and discussed.

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