

Phase structure of N=1 Super Yang-Mills theory from the gradient flow

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Composite operators of bare fermion fields evolved along a trajectory on field space by means of flow equations get renormalised multiplicatively. Therefore, even in the case of Wilson fermions, the renormalization of expectation values of fermion operators can be simplified drastically on the lattice. We measure the gluino condensate in N=1 supersymmetric Yang-Mills theory at non-zero temperatures by means of the gradient flow. The non-vanishing expectation value of the gluino condensate up to a certain critical temperature is a signal of chiral symmetry breaking, in agreement with theoretical conjectures on the vacuum structure of the theory. Furthermore, the deconfinement phase transition seems to occur close to this critical temperature, meaning that in N=1 SYM the phases of broken chiral symmetry and of confinement would coincide.

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