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Phase diagram of the G2 gauge higgs model

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G2 is the smallest simple and simply connected lie group with a trivial center. Therefore investigations of G2 gauge theories may help to clarify the relevance of center symmetry for confinement. Beside this it has an intriguing connection to SU(3) gauge theorie and to QCD. If one couples a scalar field in the fundamental representation to the gauge field one can break the G2 gauge symmetry to SU(3) gauge symmetry. 6 of the 14 gluons of G2 get a mass while 8 gluons stay massless. These 6 gluons transform with respect to their color degrees of freedom as ordinary quarks and antiquarks in QCD. We will show the full phase diagram of the G2 gauge higgs model obtained with monte carlo simulations and discuss the order of different phase transitions.

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