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Mass spectrum and symmetry breaking in Non-Abelian gauge theory with extra dimensions of two-dimensional sphere

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In the standard model, the mechanism for gauge symmetry breaking and the theoretical origin of the Higgs boson remains unclear.
Non-Abelian gauge theories in higher dimensions are good candidates to address this issue.
We have constructed a Non-Abelian gauge theory with extra dimensions of two-dimensional sphere. In this model, compared to conventional models such as those with S^1 and T^2, curvature of the extra dimensions and the non-commutative nature of the gauge group result in different features in gauge symmetry breaking process and the origin of scalar fields.
We will report the gauge symmetry breaking observed in the Kaluza-Klein expansion of four-dimensional gauge fields, as well as the mass spectrum obtained from the Kaluza-Klein expansion of the extra-dimensional gauge fields, which appear as scalar fields in our four-dimensional spacetime.

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