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Homotopy types of gauge groups related to certain 7-manifolds

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Let X be a path-connected pointed topological space and let G be a topo- logical group. Given a principal G-bundle over X, P X, the gauge group is the group of G-equivariant automorphisms of P that fix X. The study of the topology of gauge groups when X is a low dimensional manifold has played a prominent role in mathematics and mathematical physics over the last thirty years. In 2011, however, Donaldson and Segal established the mathematical set- up to construct gauge theories using principal G-bundles over high dimensional manifolds. In this talk I will present some results on the homotopy theory of gauge groups when X is a manifold that arises as the total space of a S3-bundle over S4 and G is a simply connected simple compact Lie group.