

Homotopy decompositions of gauge groups

Ingrid Membrillo-Solis (*University of Southampton,
UK*), i.membrillo-solis@soton.ac.uk

Let X be a path-connected pointed topological space and G be a topological group. Given a principal G -bundle $P \rightarrow X$, the group of bundle automorphisms covering the identity on X is called the gauge group of $P \rightarrow X$. Endowed with the compact-open topology, the gauge group of $P \rightarrow X$ is homotopy equivalent to the loop space of the path component of $\text{Map}(X, BG)$ containing the map that classifies the bundle [1]. Although the set of isomorphism classes of principal G -bundles over a finite CW -complex X might be infinite, there exist only finitely many distinct homotopy types among the gauge groups [2]. One approach to the homotopy classification problem of gauge groups is to obtain decompositions of the gauge groups or their loop spaces. In this talk I will present some results on homotopy decompositions of gauge groups when G is a compact connected simple Lie group.

References

- [1] Atiyah, M. F. and Bott, R., The Yang-Mills equations over Riemann surfaces, *Philos. Trans. R. Soc. Lond. A* **308**:1505 (1983), 523–615.
- [2] Crabb, M. C. and Sutherland, W. A., Counting homotopy types of gauge groups, *Proc. Lond. Math. Soc.* **81**:3 (2000), 747–768.