

Kishimoto, Daisuke; Kono, Akira; Tsutaya, Mitsunobu**On p -local homotopy types of gauge groups.** (English) Zbl 1305.55005

Proc. R. Soc. Edinb., Sect. A, Math. 144, No. 1, 149-160 (2014).

The gauge group, $\mathcal{G}P$, of a principal G -bundle, P , is the topological group of G -equivariant self-maps of P covering the identity on the base space, K . This paper is concerned with the determination of the p -local homotopy types of $\mathcal{G}P$ as P ranges over all principal G -bundles with base K for a Lie group G . In a previous paper, [Algebr. Geom. Topol. 13, No. 3, 1757–1778 (2013; Zbl 1276.57036)], the authors gave such a classification for principal $SU(n)$ -bundles over S^4 , with p an odd prime number such that $(p-1)(p-2) \geq n-1$.

In the paper under review, they generalize this situation to any simply connected, simple compact Lie group, G , and any sphere S^{2d} as base space. Let $\varepsilon \in \pi_{2d-1}(G)$, $k \in \mathbb{Z}$ and P_k be the principal G -bundle classified by $k\varepsilon$. The authors classify the p -local homotopy type of $\mathcal{G}P$, determined by the divisibility of the classifying map by p . One may observe that, when ε is of infinite order, “infinitely many principal bundles are divided into finite classes.” Finally, in the cases $n \leq 2p-1$ and $2 \leq d \leq p-1$, the authors give a concrete classification of gauge groups for $SU(n)$ -bundles over S^{2d} .

Reviewer: Daniel Tanré (Villeneuve d' Ascq)

MSC:**55P15** Classification of homotopy type**55P60** Localization and completion in homotopy theory**81T13** Yang-Mills and other gauge theories in quantum field theory**57S05** Topological properties of groups of homeomorphisms or diffeomorphismsCited in 6 Documents**Keywords:**

principal bundle; gauge group; unitary group

Full Text: DOI