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**Nonabelian Cohomology of Compact Lie Groups**

Given a Lie group  $G$  with finitely many components and a compact Lie group  $A$  which acts on  $G$  by automorphisms, we prove that there always exists an  $A$ -invariant maximal compact subgroup  $K$  of  $G$ , and that for every such  $K$ , the natural map  $H^1(A, K) \rightarrow H^1(A, G)$  is bijective. This generalizes a classical result of Serre and a recent result of the first and third named authors of the current paper.

**Keywords:** Nonabelian cohomology, compact Lie group, maximal compact subgroup.

**MSC:** 20J06, 22E15, 57S15