Klein, John R.; **Schochet, Claude L.**; **Smith, Samuel B.**

Continuous trace C^*-algebras, gauge groups and rationalization. (English) Zbl 1202.46066

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The goal of this paper is to determine the rational homotopy type of the unitaries UA_ζ of the section space A_ζ of the bundle $T \times_{PU_n} M_n(\mathbb{C}) \to X$, where $\zeta : T \to X$ is a principal PU_n-bundle over a compact metric space X. The algebra A_ζ is a unital continuous trace C^*-algebra and, in some sense, is the most general such. So the goal of the paper mixes together analysis with algebraic topology in a very attractive way. Now, gauge groups can be expressed as section spaces, so the authors focus on finding the rational types of gauge groups over compact metric spaces. [For finite complexes, cf. *Y. Félix* and *J. Oprea*, Proc. Am. Math. Soc. 137, No. 4, 1519–1527 (2009; Zbl 1168.55010)]. For analysts, the paper provides a great deal of the algebraic topological background necessary for the main result. In particular, the authors take great pains to explain how to proceed from results about finite complexes to results about compact metric spaces via inverse limits.

Reviewer: John F. Oprea (Cleveland)

MSC:

46L05 General theory of C^*-algebras
46J05 General theory of commutative topological algebras
46L85 Noncommutative topology
55P62 Rational homotopy theory
54C35 Function spaces in general topology
55P15 Classification of homotopy type
55P45 H-spaces and duals

Keywords:

continuous trace C^*-algebra; section space; gauge group; projective gauge group; rational H-space

Full Text: DOI arXiv

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