

Local-triviality dimension of actions of compact quantum groups

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18 WORKSHOP, BĘDLEWO 2018

Abstract

We introduce the local-triviality dimension of an action of a compact quantum group on a unital C^* -algebra using completely positive contractive order zero maps of Winter and Zacharias. In the case of a compact Hausdorff group acting on a compact Hausdorff space our definition recovers the usual local triviality of a compact principal bundle. Actions with finite local-triviality dimension are automatically free and there exists an analog of an n -universal space (in the sense of Steenrod) for any compact quantum group \mathbb{G} . Our main motivating examples are the Matsumoto-Hopf fibration and antipodal actions of free orthogonal quantum spheres. As the main application, we prove a new Borsuk-Ulam-type conjecture of Baum, Dąbrowski and Hajac in the case where the compact quantum group \mathbb{G} admits a classical subgroup whose induced action has finite local-triviality dimension.