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# Almost connected groups as $G$ -fibrant spaces

Dedicated to the memory of Professor Alexander Bykov

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## Abstract

The concept of  $G$ -*SSDR*-maps, as an equivariant version of *SSDR*-maps in the sense of F. Cathey, is defined for non compact groups actions. We prove that if  $G$  is a not necessarily compact Lie group or an almost connected metrizable group and  $N$  is its closed normal subgroup, the canonical projection  $G \rightarrow G/N$  is a strong  $G$ -fibration. As a consequence, it is shown that any almost connected metrizable group  $G$  is a  $G$ -fibrant space.

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## Introduction

In [13], Cathey introduced the shape version of strong deformation retracts, the so called *strong shape deformation retracts* (*SSDR*) and defined a fibrant space as a  $\Sigma$ -fibrant space (cf. [12]) for the class  $\Sigma$  of *SSDR*-maps. In [9], Bykov and Taxis introduced the equivariant version of a fibrant space in order to define the strong shape category for compact metrizable  $G$ -spaces ([10]) and proved that any compact metrizable group is a  $G$ -fibrant space.

As with other results in equivariant theory, we want to know whether we can define those concepts for the non-compact case obtaining analogous results. To that end, we are working with proper actions of locally compact groups. Proper actions were introduced in 1961 by Palais [18] and allowed to extend an important part of the theory of compact Lie transformation groups to the non-compact case.