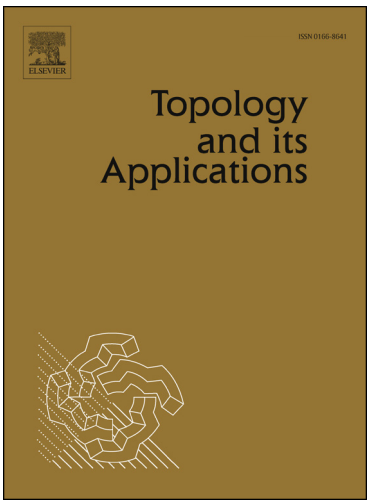

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Self-homotopy equivalences and cofibrations

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Abstract

Some relations between self-homotopy equivalences of a space and those of the induced cofiber are obtained. The results are applied to prove relations between self-closeness numbers of spaces and their mapping cones. Furthermore, various results are obtained for some types of rational spaces making use of models of Sullivan and Quillen.

Keywords: self-homotopy equivalence, self-closeness number, cofibration
2010 MSC: 55P05, 55P10, 55P62

1. Introduction

Let $\mathcal{E}(X)$ be the group of homotopy classes of self-homotopy equivalences of a space X. If a space X is obtained by a cell attachment by a map $\alpha : S^{n-1} \to B$, that is, $X = B \cup_\alpha e^n$, then some exact sequences involving $\mathcal{E}(B \cup_\alpha e^n)$ and $\mathcal{E}(B)$ are known under some conditions as in, for example, Oka, Sawashita and Sugawara [13]; the readers are referred to, for example, Sections 11 and 12 of Rutter [15] for historical theorems and various cases where $\mathcal{E}(X)$ are calculated. Thus, $\mathcal{E}(X)$ is determined making use of a cellular decomposition of a space X in some simple cases. On the other hand, Choi

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