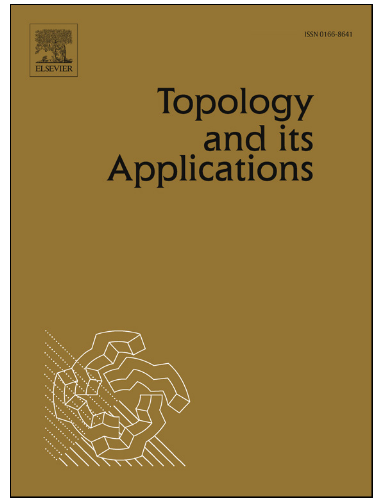

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The group of self homotopy equivalences of the m-fold smash product of a space

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Abstract

Let $\mathcal{E}(X)$ be the set of homotopy classes of self-homotopy equivalences of a space X. The set $\mathcal{E}(X)$ is a group by composition of homotopy classes. We study the group $\mathcal{E}(X^{\wedge m})$ for the m-fold smash product $X^{\wedge m}$. We show that the two obvious homomorphisms $\varphi : S_m \to \mathcal{E}(X^{\wedge m})$ and $\psi : \mathcal{E}(X)^m \to \mathcal{E}(X^{\wedge m})$ define a homomorphism $\Psi : \mathcal{E}(X)^m \rtimes S_m \to \mathcal{E}(X^{\wedge m})$ for any space X, where $\mathcal{E}(X)^m \rtimes S_m$ is the semi-direct product of the product group $\mathcal{E}(X)^m$ by the symmetric group S_m. We show that in most cases the homomorphism $\varphi : S_m \to \mathcal{E}(X^{\wedge m})$ is a monomorphism and the kernel of Ψ is isomorphic to the kernel of ψ. The injectivity of Ψ is established for the complex projective n-space $\mathbb{C}P^n$ $(n \geq 2)$, and hence, $\mathcal{E}((\mathbb{C}P^n)^{\wedge m})$ contains a subgroup isomorphic to $\{\pm 1\}^m \rtimes S_m$. Sufficient conditions for Ψ to be injective are obtained for

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