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LS-catégorie, invariants de Toomer et Ginsburg, Ext différentielle, Modèle de Sullivan, espaces elliptiques, suites spectrales.



AN ALGORITHM TO DETERMINE THE RATIONAL LS-CATEGORY OF ANY ELLIPTIC SPACE

Abstract :

The main objective of this thesis is to provide a method for determining the rational LS-category of elliptic spaces. An algebraic approximation of the LS-category has been given; more precisely, we show that the invariant $R_0(X)$ coincides with $\text{cat}_0(X)$ for any rational elliptic space X . Furthermore, we define, for any space X over an arbitrary field K , an Ext-version homotopy invariant $L_K(X)$, of the Ginsburg invariant $l_K(X)$. We then establish the equality between $L_0(X) := L_Q(X)$ et $l_0(X)$ when X is rationally elliptic. Let X be a rationally elliptic space, we present three algorithms which, together, induce a generating class of $\text{Ext}_{(\Lambda V, d)}^N(Q, (\Lambda V, d))$, where N is the formal dimension of X . From these algorithms, we derive an algorithm for computing the Lusternik-Schnirelmann rational category $\text{cat}_0(X)$. Furthermore, by applying a spectral sequence argument based on the Eilenberg-Moore spectral sequence, we compute the rational Ginsburg invariant $l_0(X)$.

Key Words :

LS-category, Toomer and Ginsburg's invariant, Differential Ext, Sullivan model, elliptic spaces, spectral sequences.