

PROPAGATION OF RESONANCE AND CHARACTERISTIC VARIETIES

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Abstract

Suppose X is a topological space and k a field. For every $a \in H^1(X; k)$ denote by $H^p(a)$ the p th cohomology space of the complex $H^*(X; k)$ with the differential defined by the multiplication by a . The p th resonance variety of X is the set $R^p = \{a \in H^1(X; k) | H^p(a) \neq 0\}$. We say that the resonance varieties (or the cohomology $H^*(a)$) propagate if $R^p \subset R^q$ for every $0 < p < q \leq \dim X$.

For complements of complex hyperplane arrangements, the propagation of resonance varieties was noticed first in a paper by Eisenbud, Popescu, and Y as a side effect of the BGG - correspondence. More recently Denham, Suciu and Y related it to duality spaces studied by M.Davis et al. Using that relation one can extend the propagation to characteristic varieties defined in a similar way for cohomology with local coefficient systems.

In the talk, we will define the varieties in more detail and discuss what is known about the propagation.