

Higher Signature on Witt spaces

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Abstract: The signature is a fundamental homotopy invariant for topological manifolds. However, for spaces with singularities, this usual notion of signature ceases to exist, since, in general, spaces with singularities fail the usual Poincaré duality. A generalized Poincaré duality theorem for spaces with singularities was proven by Goresky and MacPherson using intersection homology. The classical signature was then extended to Witt spaces by Siegel using this generalized Poincaré duality. Witt spaces are a natural class of spaces with singularities. For example, all complex algebraic varieties are Witt spaces.

In this talk, I will describe a combinatorial approach to the higher signature of Witt spaces, using methods of noncommutative geometry. This is based on joint work with Nigel Higson.