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Tobias R Pecher* (tpecher@math.upb.de), Institut für Mathematik, Universität Paderborn,
Warburger Str. 100, 33098 Paderborn, Germany. *Howe duality and Multiplicity-free actions.*

Let V be a finite dimensional representation of a reductive group G . The geometric problem, whether there is a Zariski open B -orbit in V (i.e., if V is spherical) is equivalent to the multiplicity-freeness of the symmetric algebra of (the dual of) V . It is also natural to consider the question when the exterior algebra of V is multiplicity-free. Unlike in the symmetric case, there is no geometric counterpart of this condition. However, the lists of multiplicity-free symmetric and exterior algebras are intimately related to each other.

The purpose of this talk is to give an explanation of this phenomenon by tracing back (skew) multiplicity-free actions to realizations of Howe dual pairs. We also discuss further applications of this approach to harmonic analysis and multiplicity-freeness results for Lie superalgebras. (Received September 24, 2012)