

Seminari de Geometria Algebraica 2007/2008 (UB-UPC)

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Special cohomology classes arising from the Weil representation

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The theta correspondence and the Weil representation are a well-known tool to study arithmetic and cohomological aspects of orthogonal group. In this talk we give an introduction to the subject. In particular, we construct certain, “special”, cohomology classes for the orthogonal group with coefficients in a finite dimensional representation. These classes are generalizations of previous work of Kudla and Millson. We discuss its geometric properties as Poincare dual forms for certain, “special”, cycles with non-trivial coefficients.

Furthermore, we also determine the behavior of the classes at the boundary of the Borel-Serre compactification of arithmetic quotients of the associated symmetric space for the orthogonal group. As a consequence we obtain new non-vanishing results for these cycles.

This is joint work with J. Millson.
