1023-22-1323   **Jens P Funke*** (`jfunke@nmsu.edu`), Department of Mathematical Sciences, New Mexico State University, 3MB, P.O.Box 30001, Las Cruces, NM 88003. *Special cohomology classes arising from the Weil representation.*

We present recent work with J. Millson.

Using the dual pair $Sp(n) \times O(p,q)$, we construct certain, "special", cohomology classes for $O(p,q)$ with values in the Weil representation. These classes are generalizations of previous work of Kudla and Millson. We discuss its geometric properties as Poincaré dual forms for certain, "special", cycles with coefficients in a finite dimensional representation of the orthogonal group. Moreover, globally, theta series associated to these classes give rise to vector-valued holomorphic Siegel modular forms. Furthermore, we also discuss the behaviour of the classes at the boundary of the Borel-Serre compactification of arithmetic quotients of the associated symmetric space for $O(p,q)$. (Received September 25, 2006)