Meeting: 1007, Santa Barbara, California, SS 8A, Special Session on Geometry and Physics

1007-58-69 **Eugenie Hunsicker*** (hunsicke@lawrence.edu), Department of Mathematics, Lawrence University, Appleton, WI 54911. *Ideal boundary conditions, intersection cohomology and Leray spectral sequences.*

In order to understand which shapes of universes are possible in string theory, physicists are interested in the space of self-dual harmonic forms on a variety of noncompact and singular manifolds. Cheeger and Dai have examined L^2 cohomology on manifolds whose ends have the geometry of a fibre bundle over a compact manifold, where the fibres are the cone on a second compact manifold. They have proved that the L^2 cohomology of such a manifold is isomorphic to the middle perversity intersection cohomology of the natural compactification of the manifold in the case that the cones in the fibres are over an odd dimensional manifold. In this case, they have also used analysis of the spectral sequence of the boundary fibration to prove a signature theorem. This talk will present a generalization of their results which shows a broader relationship between L^2 cohomology of singular spaces, intersection cohomology of varying perversities, and the spectral sequence of a fibration. (Received January 30, 2005)