Meeting: 1003, Atlanta, Georgia, SS 14A, AMS Special Session on D-Modules, I

1003-14-1111 **John Scherk*** (scherk@math.toronto.edu), Dept. of Mathematics, University of Toronto, 100 St. George St., Toronto, Ontario M5S3G3, Canada. *The Borel-Serre Compactification for the Classifying Space of Hodge Structures.*

To better understand the degeneration of Hodge structures it is of interest to study compactifications of their classifying spaces. Suppose that D is such a classifying space with automorphism group G. Let $S \subset \mathbb{C}$ be the unit disc, $S^* = S \setminus \{0\}$, and

$$f : S^* \to G_{\mathbb{Z}} \backslash D$$

a holomorphic, horizontal, locally liftable map, i.e. a variation of Hodge structures on S^*. Then after "untwisting" f, it extends continuously to a map into the reductive Borel-Serre compactification:

$$\hat{f} : S \to G_{\mathbb{Z}} \backslash \bar{D}^{RBS} .$$

The questions then arise: which boundary components of $G_{\mathbb{Z}} \backslash \bar{D}^{RBS}$ can such a map $\hat{f}$ meet? How is the boundary component containing $\hat{f}(0)$ related to the limit mixed Hodge structure? Answers to these questions are given in terms of a root system of G and the Hodge structure on its Lie algebra. The key result is a characterization of the "support" of a horizontal $sl(2)$- representation, a set of simple roots of G. (Received October 04, 2004)