1036-11-49 **Steven J Miller*** (sjmiller@math.brown.edu), Mathematics Department, Brown University, 151 Thayer St, Providence, RI 02912. A Symplectic Test of the L-Functions Ratios Conjecture.

Recently Conrey, Farmer and Zirnbauer conjectured formulas for the averages over a family of ratios of products of shifted L-functions. Their L-functions Ratios Conjecture predicts both the main and lower order terms for many problems, ranging from n-level correlations and densities to mollifiers and moments to vanishing at the central point. There are many results showing agreement between the main terms of number theory and random matrix theory; however, there are few families where the lower order terms are known. These terms can depend on subtle arithmetic properties of the family, and provide a way to break the universality of behavior. The Ratios Conjecture provides a powerful and tractable way to predict these terms. We test a specific case here, that of the 1-level density for the symplectic family of quadratic Dirichlet characters arising from even fundamental discriminants d < X. For test functions supported in (-1/3, 1/3) we calculate all the lower order terms up to size $O(|X|^{-1/2+\epsilon})$ and see perfect agreement with the conjecture. Thus for this family and suitably restricted test functions, we completely verify the conjecture's prediction for the 1-level density. If time permits we will discuss other families. (Received December 27, 2007)