A GENERATING FUNCTION FOR LOCALLY HARMONIC MAASS FORMS

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ABSTRACT. In this talk, we consider an analogue to Kohnen and Zagier's classical holomorphic kernel function for the Shimura and Shintani lifts. In the classical case, they package certain "quadratic form" Poincar series into a generating function and then show that the resulting function satisfies (positive) integral weight modularity in one variable and (positive) half-integral weight modularity in the other variable. A recent locally harmonic Maass form (of negative weight) is naturally connected to the quadratic form Poincar series appearing in Kohnen and Zagier's kernel function. We discuss the modularity of the analogous generating function of these locally harmonic Maass forms, showing that although it is not itself modular, it is mock modular in the sense that it can be naturally completed to obtain a function which satisfies half-integral weight modularity. This talk is based on joint work with Kathrin Bringmann and Sander Zwegers.