



Locally harmonic Maass forms and the kernel of the Shintani lift

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In this paper we define a new type of modular object and construct explicit examples of such functions. Our functions are closely related to cusp forms constructed by Zagier which played an important role in the construction by Kohnen and Zagier of a kernel function for the Shimura and Shintani lifts between half-integral and integral weight cusp forms. Although our functions share many properties in common with harmonic weak Maass forms, they also have some properties which strikingly contrast those exhibited by harmonic weak Maass forms. As a first application of the new theory developed in this paper, one obtains a new proof of the fact that the even periods of Zagier's cusp forms are rational as an easy corollary.

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