

## Realizations by finite-area quadratic differentials

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**Abstract.** Hubbard and Masur proved that any measured foliation on a closed Riemann surface can be realized by the horizontal foliation of a holomorphic quadratic differential. We extend this result to arbitrary Riemann surfaces (including the unit disk, or any infinite genus surface) by characterizing measured foliations that can be realized by the horizontal foliations of finite-area holomorphic quadratic differentials. Some corollaries of this characterization include application to the type problem of Riemann surfaces. Another direction shows that the differentials with one cylinder are dense in the  $L^1$  norm among all differentials when the Riemann surface does not have Green's function. In a recent joint work with T. Shima, we showed that this is false for Riemann surfaces of infinite complexity whose covering group is of the second kind. Finally, we give a characterization of the Teichmüller extremal maps in terms of the height map. Supported in part by NSF DMS-2521870.

**Keywords:** measured foliations; holomorphic quadratic differentials; Riemann surfaces; Green functions; Teichmüller extremal maps.