

Quadratic differentials with closed trajectories on compact Riemann surfaces

By

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§ 1. Introduction

In this paper we shall consider the family of meromorphic quadratic differentials with only simple poles on a compact Riemann surface. The quadratic differentials with closed trajectories are in a sense exceptional and have several extremal properties in above family (cf. [4], [8], [9]). Strebel ([10]) stated under a certain assumption that they are dense in the family. It is the first purpose of this paper to get rid of that assumption and show a new complete proof. The proof will be shown in §3. Relating to this fact we show in §4 that a holomorphic abelian differential whose square has closed trajectories is not always proportional to a holomorphic reproducing differential.

Strebel also considered the relation between the Teichmüller theory and the contractions of holomorphic quadratic differentials with closed trajectories. In the case of the unit disk with a finite set of preassigned points he gave successful results ([8]). As an application of our Theorem 1, the similar close relations between them are shown (§5) in the case of compact Riemann surfaces.

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