On compactifications of strata of abelian differentials

Quentin Gendron

1.2.18

Let $\mathcal{M}_{g,n}$ be the moduli space of Riemann surfaces of genus $g \geq 2$ with n pairwise distinct marked points $z_i \in X$. For each partition $k = (k_1, \ldots, k_n)$ of $2g-2$ we define the "stratum"

$$\mathcal{M}_g(k) = \left\{ (X, z_1, \cdots, z_n); \sum_{i=1}^{n} k_i z_i \sim K_X \right\} \subset \mathcal{M}_{g,n},$$

where K_X is the canonical divisor of X.

I will to present the description of its closure in the Deligne-Mumford compactification $\overline{\mathcal{M}}_{g,n}$ that I obtained together with M. Bainbridge, D. Chen, S. Grushevsky and M. Möller. In addition, I would like to explain why this result is not completely satisfactory and give an idea of the efforts we are making to construct a better compactification of the strata.