

Loewner Energy, Renormalized Volume and their Weil-Petersson gradient flows

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The Loewner energy for Jordan curves is a Kähler potential on the Weil–Petersson universal Teichmüller space. We show that, under regularity assumptions, the Loewner energy equals the renormalized volume of the hyperbolic 3-manifold bounded by the two Epstein–Poincaré surfaces associated with the quasicircle. We also show that, like the gradient flow for renormalized volume for acylindrical manifold, which flows to the unique structure with totally geodesic core boundary boundary, the gradient flow of Loewner energy with respect to the Weil–Petersson metric always converges to the origin (the circle). This is joint work with Kenneth Bromberg, Franco Vargas Pallete and Yilin Wang

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