

Conformal moduli and lower homeomorphisms

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We consider the homeomorphisms satisfying at least one of the following conditions

$$\mathcal{M}_\alpha(f(\mathcal{S}_k)) \leq \inf_{\rho \in \text{adm } \mathcal{S}_k} \int_G \rho^\alpha(x) Q(x) dx, \quad (1)$$

$$\mathcal{M}_\alpha(f(\mathcal{S}_k)) \geq \inf_{\varrho \in \text{extadm } \mathcal{S}_k} \int_G \frac{\varrho^\alpha(x)}{Q(x)} dx, \quad (2)$$

with a given measurable function $Q : G \rightarrow [0, \infty]$. For such mappings the problem can be formulated somewhat similarly to the classical problem on the properties of solutions to the Beltrami equation $f_{\bar{z}} = \mu(z)f_z$, for which the properties of f are investigated in their dependence on the features of μ . The main cases in (1)-(2) relate to $k = 1$ and $k = n - 1$, i.e. to moduli of curve and of $(n - 1)$ -surface families. We show that inequality (1) yields differentiability a.e., the (N) -property, boundedness of the α -inner dilatation. We also provide the necessary and sufficient condition for a homeomorphism to satisfy (2). Finally, we establish the relationship between homeomorphisms satisfying (1) for $k = 1$ and (2) for $k = n - 1$.

Joint talk with Ruslan Salimov (Institute of Applied Mathematics and Mechanics, Donetsk, Ukraine)