Dybov, Yu. P.
On a variational method for a class of solutions of the quasi-linear Beltrami equation.
(Russian. English summary) [Zbl 0705.30025]

Let $\mathcal{F}$ denote the family of quasiconformal mappings $f: \mathbb{C} \to \mathbb{C}$. The author constructs a variational method for the class $\mathcal{F}$ with variations of the form $f_t = f - t\Phi \circ f + o(t)$.

Various restrictions are imposed on the complex dilatations and other functions that occur. Then the author gives conditions that must be satisfied if $f \in \mathcal{F}$ is an extremal function for some arbitrary Gateaux differentiable functional. The results extend results obtained by M. Schiffer and G. Schober [J. Anal. Math. 34, 240-264 (1978; Zbl 0419.30018)] and by V. Ya. Gutlyanskij and V. I. Ryasanov [Sib. Mat. Zh. 28, No.1(161), 81-85 (1987; Zbl 0623.30028)].

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MSC:
30C70 Extremal problems for conformal and quasiconformal mappings, variational methods

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quasiconformal mapping; Gateaux differentiable functional