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ON SOME FAMILIES OF MINIMAL SURFACES IN $\mathbb{R}^3$

Let $g : D^2 \to \mathbb{R}^{\nvDash}$ be a conformal representation of a generalized minimal surface S and π be its orthogonal projection onto the chosen coordinate plane. The surface will be called “a good surface” if the mapping $\pi \circ g$ is an interior mapping. Let B be a family of closed broken lines in $\mathbb{R}^{\nvDash}$ with co-directed segments and let G denote the family of “good minimal surfaces” bounded by lines belonging to B. The restriction of gaussian mapping of surfaces $S \in G$ to the boundary generates another family of planar closed curves of specific kind and thus the condition of the existence of interior extension of these curves is one of the necessary conditions for $G \neq \varnothing$. The second necessary condition we obtain by the calculation of orders of zeros and poles of some quadratic differential assosiated with conformal representation of surfaces of the family G. Using the solution of Riemann–Hilbert boundary value problem we show that these two necessary conditions jointly are sufficient conditions as well.