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Zero Frequency Sounding in Layered Media[1] CHASTITY AUTRY, Physics Department, Georgia State University, ALEXANDRU TAMASAN, JOHANN VERAS, Mathematics Department, University of Central Florida —
We consider the mathematical model of frequency sounding of a continuously layered media. By the means of frequency asymptotic expansion of the wave field, this problem is equivalent to an inverse boundary value problem for the Ricatti equation. We solve the inverse Ricatti problem via a Cauchy problem for a first order quadratic equation for sequence-valued maps. The quadratic equation contains no unknown coefficients. The information of the medium is encoded in the initial value. For specific data, the Cauchy problem has a unique solution. Based on the contraction mapping principle the method of proof provides a stable reconstruction algorithm. The computational feasibility of the proposed approach is demonstrated in a numerical experiment.

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