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Mathematical model of spontaneous potential well-logging and its numerical solutions. (English) [Zbl 1296.35001](#)

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The book is devoted to the mathematical model and solution technique for the spontaneous potential well-logging. The corresponding mathematical model should be the boundary value problem of quasi-harmonic partial differential equations with inhomogeneous interface conditions. In axi-symmetric situation, at the crossing point of multiple interfaces, the compatible condition is usually violated so that it is not possible to get a solution to the boundary value problem in the sense of piecewise H^1 space. In the book the solution is sought in piecewise $W^{1,p}$ space $1 < p < 2$. In the book, in the axi-symmetric situation it is demonstrated the well-posedness of the corresponding mathematical model and arc developed three efficient schemes of numerical solution to meet the need of practical computation.

Reviewer: [Alla Boikova \(Penza\)](#)

MSC:

- [35-01](#) Introductory exposition (textbooks, tutorial papers, etc.) pertaining to partial differential equations
- [35J25](#) Boundary value problems for second-order elliptic equations
- [86A20](#) Potentials, prospecting
- [65Z05](#) Applications to the sciences
- [35Q86](#) PDEs in connection with geophysics

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