Anomaly Detection in Random Heterogeneous Media

By Martin Simon

Springer-Verlag Gmbh Jul 2015, 2015. Taschenbuch. Book Condition: Neu. 211x146x15 mm. Neuware - This monograph is concerned with the analysis and numerical solution of a stochastic inverse anomaly detection problem in electrical impedance tomography (EIT). Martin Simon studies the problem of detecting a parameterized anomaly in an isotropic, stationary and ergodic conductivity random field whose realizations are rapidly oscillating. For this purpose, he derives Feynman-Kac formulae to rigorously justify stochastic homogenization in the case of the underlying stochastic boundary value problem. The author combines techniques from the theory of partial differential equations and functional analysis with probabilistic ideas, paving the way to new mathematical theorems which may be fruitfully used in the treatment of the problem at hand. Moreover, the author proposes an efficient numerical method in the framework of Bayesian inversion for the practical solution of the stochastic inverse anomaly detection problem. 150 pp. Englisch.

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