

Inverse interface determination using a level-set approach

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Abstract. The paper should have maximum 10 pages.

1 Introduction

Permeability spans several order of magnitudes over different length scales and dynamic data from wells provide important information for permeability estimation.

This classical but fundamental inverse problem of groundwater flows, as named in the review paper by [4], with obvious importance to the oil industry, is naturally suited to a zonation approach in which the permeability of each zone of the inhomogeneous aquifer is unknown and has to be inferred from piezometric head measurements.

2 Mathematical formulation

Consider the steady-state reaction-diffusion equation

$$-\nabla \cdot (a(\mathbf{x})\nabla u) + C(\mathbf{x})u = Q(\mathbf{x}), \quad \mathbf{x} \in \Omega := (-1, 1)^2. \quad (1)$$

3 Conclusions

A simple, easy-to-use and fast regularised level-set approach has been devised to find the interfaces between materials.

Acknowledgements

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Figures should be black and white, i.e. no colour. Use different line styles or markers. The numbering and lettering on the axes should be big.

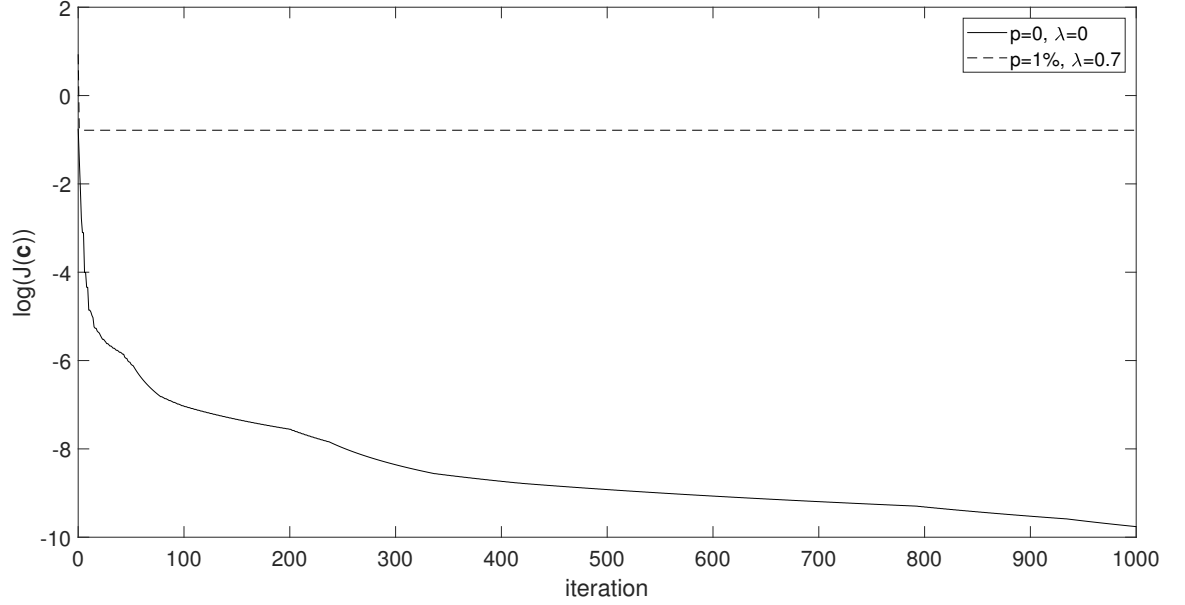


Figure 1: Logarithm of the objective function.

Please use consistently the reference style below.

References

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- [4] W.W.-G. Yeh (1986) Review of parameter identification procedures in groundwater hydrology: The inverse problem, *Water Resources Research*, **22**, 95-108.