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# Detecting Inclusions in Soil Profiles

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We propose a computational framework to evaluate the presence of inclusions of different kinds of materials in specific soil profiles by full waveform inversion. We construct a cost functional using the data recorded at a grid of receivers in response to signals emitted by a set of sources. Next, we propose posible shapes and locations for the inclusions by topological energy techniques, which we parametrize in terms of a moderate number of parameters [**?**, **?**, **?**, **?**]. Then, we implement constrained optimization schemes which decrease the cost starting from the selected initial guess and subject to wave equation constraints. Numerical simulations illustrate the performance of the method [**?**].

## References

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