



# Rough surface reconstruction using far-field acoustic measurements

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**PACS:** 43.20.EL, 43.20.BI

## **ABSTRACT**

The technique of back-propagating plane waves to reconstruct the acoustic field before it reaches the spatial area where it is measured, is used to image the field in the region consisting of the corrugated interface between an solid and a liquid. Numerical experiments are performed applying the finite element technique to establish realistic situations. It is verified to what extent this method enables a correct reconstruction of the interface as a function of width and height, taking into account the possibility of internal reflections. The results are important to determine in what regime the plane wave expansion technique, first developed by Lord Rayleigh and nowadays often used in phononic crystals, in diffraction simulations etc., is applicable.