## Band Structures of Phononic Crystals with Defects Based on the Boundary

## **Element Method**

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## Abstract

The boundary element method is applied to compute the defects of the two-dimensional solidfluid phononic crystals with a square lattice based on the supercell technique. In a supercell, the boundary integral equations of the inclusions and the matrix are established. By substituting the Bloch periodic boundary conditions and the interface conditions between the matrix and the scatterers, a linear eigenvalue equation is derived. To verify the accuracy and efficiency of the boundary element method, the point and line defects of the solid/fluid system are calculated and analyzed, and the obtained results are compared with those computed by the other methods. The numerical results show that the boundary element method is accurate and effective for the calculation of the phononic crystals with defects, and it can be used in the filters and waveguides due to the properties of the defect states.

Keywords: phononic crystals; defect states; boundary element method

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