

Abstract Submitted
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Rotational Modes in Phononic Crystals¹ YING WU, PAI PENG,
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versity of Technology — We propose a lumped model for the rotational modes in
two-dimensional phononic crystals comprised of square arrays of solid cylindrical
scatterers in solid hosts. The model not only can reproduce the dispersion rela-
tions in a certain range with one fitted parameter, but also gives simple analytical
expressions for the frequencies of the eigenmodes at the high symmetry points in
the Brillouin zone. These expressions provide physical understandings of the ro-
tational modes as well as certain translational and hybrid mode, and predict the
presence of accidental degeneracy of the rotational and dipolar modes, which leads
to a Dirac-like cone in the Brillouin zone center.

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