Coupled Acoustic-Mechanical Bandgaps

In this work, we study the existence of coupled bandgaps for corrugated plate structures and acoustic channels. The study is motivated by the observation that the performance of traditional bandgap structures, such as periodic plates, may be compromised due to the coupling to a surrounding acoustic medium and the presence of acoustic resonances. It is demonstrated that corrugation of the plate structure can introduce bending wave bandgaps and bandgaps in the acoustic domain in overlapping and audible frequency ranges. This effect is preserved also when taking the physical coupling between the two domains into account. Additionally, the coupling is shown to introduce extra gaps in the band structure due to modal interaction and the appearance of a cut-on frequency for the fundamental acoustic mode.

General information
State: Published
Organisations: Department of Electrical Engineering, Acoustic Technology, Department of Mechanical Engineering
Contributors: Jensen, J. S., Kook, J.
Number of pages: 12
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Crystals
Volume: 6
Issue number: 9
ISSN (Print): 2073-4352
Ratings:
Web of Science (2018): Indexed yes
Scopus rating (2017): CiteScore 1.97 SJR 0.566 SNIP 0.745
Web of Science (2017): Impact factor 2.144
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 1.89 SJR 0.544 SNIP 0.768
Web of Science (2016): Impact factor 1.566
Web of Science (2016): Indexed yes
Scopus rating (2015): CiteScore 1.47 SJR 0.567 SNIP 0.713
Web of Science (2015): Impact factor 2.075
Scopus rating (2014): CiteScore 1.03 SJR 0.464 SNIP 0.648
Web of Science (2014): Indexed yes
Scopus rating (2013): CiteScore 0.77 SJR 0.355 SNIP 0.684
ISI indexed (2013): ISI indexed no
Scopus rating (2012): SJR 0.182 SNIP 0.257
ISI indexed (2012): ISI indexed no
Original language: English
Keywords: Acoustic-mechanical coupling, Bandgaps
Electronic versions:
crystals_06_00112.pdf
DOIs:
10.3390/cryst6090112
Source: FindIt
Source-ID: 2343058118
Research output: Research - peer-review › Journal article – Annual report year: 2016