Control of Lamb Waves by Phononic Plates

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Any vibration in a thin elastic plate can be decomposed in three fundamental modes, which present different propagation characteristics, which suggest that the design of devices for their control have to be designed for a specific mode. We present here a summary of our recent works concerning the full control of elastic waves in thin structured plates. First, several devices for the control of flexural waves (A0 mode) will be discussed and analysed. It will be shown that the theory developed for the control of the A0 mode can also be applied to the control of the symmetric Lamb mode (S0 mode). Finally, a general approach to include the propagation of shear waves (SH0 mode) will be presented, showing how it is possible the design of refractive devices working simultaneously for all the three fundamental Lamb modes (see Fig.1).

Figures

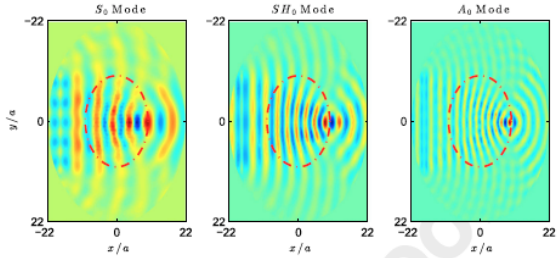

Figure 1: Luneburg lens designed to work simultaneously for the A0, S0 and SH0 modes.

References

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