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**Development of a suitable PML for an harmonic study of a finite
1D phononic crystal**

Maxime Bavencoffe^a, Bruno Morvan^a, Anne-Christine Hladky^b, Olivier Bou Matar^b and Jean-Louis Izbicki^a

^aLOMC FRE-3102 CNRS, Groupe Ondes Acoustiques, University of Le Havre, Place Robert Schuman, BP
4006, 76610 Le Havre, France

^bIEMN, UMR CNRS 8520, avenue Poincaré, BP 60069, 59652 Villeneuve d'Ascq, France

This paper deals with the interaction of ultrasonic Lamb waves with a 1D phononic crystal. The studied structure is a finite plate with a periodic corrugated surface. Two types of forbidden bands arise in the Lamb wave dispersion curves. The first one is located at the limit of the first Brillouin zone, the second one exists at the crossing of dispersion curves of two different Lamb modes. These forbidden bands lead to conversion phenomena. In order to study accurately the conversion phenomena in the band gaps, harmonic finite element analysis are performed. Perfect matching layers (PML) on both sides of the plate are then necessary to avoid stationary waves. PML, adapted for Lamb modes involved at a given frequency, must be designed. By using these PML, the attenuation of Lamb waves propagating in the phononic crystal is clearly shown and is related to the existence of the forbidden band.