POLITECNICO
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MSc. Music and Acoustic Engineering

Musical Acoustics - A.Y. 2020/2021

Homework 3 - Sound Radiation from Plates

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1 Adjusting the radiation cutoff with the right thickness

Assuming an infinite plate, we can study the sound radiation by imposing that the air's velocity field and the plate velocity are equal on the plate's surface. This yields the following expression for the component of the acoustic wave vector normal to the surface:

$$k_z = \omega \sqrt{\frac{1}{c^2} - \frac{1}{v_p^2}}$$

where c is the sound velocity in air and v_p is the velocity of the bending waves in the plate.