

## **Absorption enhancement in poro-elastic materials by mass inclusion, exploiting the mass-spring effect**

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In this paper the possibility of enhancing the absorption coefficient of poro-elastic material using small, elastic mass inclusion in frequencies lower than quarter-wavelength resonance of the porous material is discussed. We show that the absorption peaks can be achieved not only by what is known in literature as the trapped mode effect, but also by the resonance of small, elastic inclusion at low frequencies, which can be interpreted as mass-spring effect. In this work, the inclusion and the porous skeleton is considered elastic and fully coupled to each other, therefore accounting for all types of energy dissipation. Additionally, the inclusions are also modeled as rigid to distinguish between the trapped mode effect and the mass-spring effect. Moreover, the distinction between these two effects are explained in more detail by comparing the dissipated energy by each mechanism (viscous, thermal and structural effect).