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Simultaneous hypersonic and optical mirrors in nanometric porous silicon multilayers JESUS MANZANARES-MARTINEZ, Departamento de Investigacion en Fisica, Universidad de Sonora, Apartado Postal 5-088, Hermosillo, Sonora 83180, Mexico, PAOLA CASTRO-GARAY, DAMIAN MOCTEZUMA-ENRIQUEZ, YOHAN JASDID RODRIGUEZ-VIVEROS, Departamento de Fisica, Universidad de Sonora, Blvd. Luis Encinas y Rosales, Hermosillo, Sonora 83180, Mexico. — We study by theoretical simulations the non-perpendicular propagation of electromagnetic and elastic waves in Porous Silicon Multilayers (PSM). Our work is inspired by recent experimental results where the angular variation of the optical and hypersonic stop bands has been explored in PSM. [L. C. Parsons and G. T. Andrews, J. Appl. Phys. 111, 123521 (2012)] We proceed in three steps. First, we found the conditions to obtain a simultaneous photonic-phononic mirror at normal incidence. Second, we determined the angular variation of the mirrors computing the projected band structure. Finally, we found the conditions to obtain an omnidirectional mirror for hypersonic waves. However, we have found that for the optical case the mirror is limited to an angular cone.

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