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Trapping effect on the sound velocity of a multilayer Fermi gas[1]
PATRICIA SALAS, M. A. SOLíS, Instituto de Fisica, UNAM — We present the trapping effect on the behavior of the isothermal compressibility and sound velocity for an interactionless Fermi gas immersed in a periodic interconnected multilayer structure created by an external Dirac comb potential which can vary both in spacing and in the intensity that controls the impenetrability of the layer edge (the wall) [1]. At $T = 0$, for a given layer width and respect to the free ideal Fermi gas values, the isothermal compressibility as a function of the impenetrability starts in one and then monotonically increases to reach a larger constant value which is width dependent. The sound velocity as a function of impenetrability starts in one and for a range of impenetrabilities shows a bump which suggests that the presence of the structure increases the speed. For a finite temperature, given a separation between the walls and several values of their impenetrabilities, both properties start their evolution in temperature from the ideal Fermi gas value, unfold at temperatures near and under T_F, and then recover the behavior of a classical gas at higher temperatures.
[1] P. Salas and M.A. Solís, "Trapping effect of periodic structures on the thermodynamic properties of a Fermi gas", J. Low Temp, Phys. **175**, 427 (2014).

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