

Abstract Submitted  
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**Heat capacity and sound velocities of low dimensional Fermi gases**

P. SALAS, M.A. SOLIS, Instituto de Fisica, UNAM, Mexico — We report the heat capacity ratio and sound velocities for an interactionless Fermi gas immersed in periodic structures such as penetrable multilayers or multitubes created by one (planes) or two perpendicular (tubes) external Dirac comb potentials. The isobaric specific heat of the fermion gas presents the dimensional crossover previously observed in the isochoric specific heat [1] - from 3D to 2D or to 1D -. The quotient between the two quantities has a prominent bump related to the confinement, and as the temperature increases, it goes towards the monoatomic classical gas value  $5/3$ . We present the isothermal and the adiabatic sound velocities of the fermion gas which show anomalous behavior at temperatures below  $T_F$  due to the dimensionality of the system, while at higher temperatures again we recover the behavior of a classical Fermi gas. Furthermore, as the temperature goes to zero the sound velocity has a finite value, as expected.

[1] P. Salas and M.A. Solís, “Trapping effect of periodic structures on the thermodynamic properties of a Fermi gas,” *J. Low Temp, Phys.* (2013) DOI 10.1007/s10909-013-0939-x.

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