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Heat capacity ratio and sound velocities for a Bose gas in multi-slabs O.A. RODRIGUEZ, M.A. SOLIS, Instituto de Fisica, UNAM, Mexico — The heat capacity ratio (c_p/c_V) and adiabatic sound velocity (c_S) are reported for an inhomogeneous Bose gas with mass distribution arranged in multi-slabs. The mass distribution is generated by applying a Kronig-Penney potential in one direction on a 3D Bose gas while the bosons are free to move in the other two directions. Since the isobaric specific heat is indeterminate for $T \leq T_c$, we show the heat capacity ratio as a function of T only for $T > T_c$, for six values of potential spatial period $a+b$: it diverges at T_c, after a threshold temperature we recover the 3D classical value 5/3, and for intermediate temperatures its behavior shows a dimensional "crossover" from 3D to 2D. The average adiabatic sound velocity has two main features: above T_c it is proportional to $T^{1/2}$, as a classical gas, while for temperatures below T_c it goes as $T^{5/4}$ with a small deviation from this value which depends on the lattice parameter.

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