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Specific heat of bosons in periodical bilayers O.A. RODRIGUEZ, P. SALAS, UNAM, M.A. SOLIS, Instituto de Fisica, UNAM — We report the specific heat at constant volume of an ideal boson gas inside a periodical bilayer structure modeled with a generalized Kronig-Penney (KP) delta potential in the z-direction while the particles are free in the other two directions. The generalized KP potential has two different strength delta potentials by unit cell, and they are separated βa, where a is the unit cell length and $0 \leq \beta \leq 1$. After calculating the energy band structure we use it to obtain the Bose-Einstein condensation critical temperature besides the chemical potential, the internal energy and the specific heat, as functions of the temperature, for different values of the parameters a, β and the delta strengths. For any parameter set we observe a Bose-Einstein condensation at a lower temperature than that of an infinite ideal Bose gas in the thermodynamic limit and with the same particle density. From the specific heat we distinguish at least four characteristic lengths. They are associated to the thermal wave length values at: the BEC critical temperature where the specific heat shows a peak and a discontinuity in their derivative; two minima of the specific heat where the thermal wave lengths are equal to two times the plane separations βa and $(a - \beta a)$; and about 0.7 times the minimum plane separation, where the specific heat behavior returns to that of an ideal Bose gas. Also the delta strength effects on the specific heat are discussed.

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