

Abstract Submitted  
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**Bose gas with generalized dispersion relation plus an energy gap<sup>1</sup>**

M. A. SOLIS, Instituto de Física, UNAM, J. G. MARTINEZ, J. GARCIA, Facultad de Ciencias, UNAM — We report the critical temperature, the condensed fraction, the internal energy and the specific heat for a  $d$ -dimensional Bose gas with a generalized dispersion relation plus an energy gap, i.e.,  $\varepsilon = \varepsilon_0$  for  $k = 0$  and  $\varepsilon = \varepsilon_0 + \Delta + c_s k^s$ , for  $k > 0$ , where  $\hbar k$  is the particle momentum,  $\varepsilon_0$  the lowest particle energy,  $c_s$  a constant with dimension of energy multiplied by a length to the power  $s > 0$ . When  $\Delta > 0$ , a Bose-Einstein critical temperature  $T_c \neq 0$  exists for any  $d/s \geq 0$  at which the internal energy shows a peak and the specific heat shows a jump. The critical temperature and the specific heat jump increase as functions of the gap but they decrease as functions of  $d/s$ . Thermodynamic properties are  $\varepsilon_0$  independent since this is just a reference energy. For  $\Delta = 0$  we recover the results reported in Ref. [1].

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Salas P.  
Instituto de Física, UNAM

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