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*MgB*₂ under pressure; band-filling, phonon hardening and electrical anisotropy

JESUS VAZQUEZ, SABINA RUIZ-CHAVARRIA, PABLO DE LA MORA, Fac. de Ciencias, Universidad Nacional Autonoma de Mexico — The electrical two-dimensional character has been accepted as an important factor in the high *T*ₐ superconductors. In *MgB*₂ it is the almost two dimensional σ-bands that are responsible for the superconductivity. On the other hand in *MgB*₂ the band-filling and phonon hardening have been found to be the responsible for the high *T*ₐ [1]. But previous calculations [2] have shown that with pressure both, electrical anisotropy and *T*ₐ are reduced. Thus the question arises: Is the electrical anisotropy, together with band-filling and phonon hardening, also responsible of the high *T*ₐ in *MgB*₂? Using the WIEN2k package the *MgB*₂ superconductor is analyzed as function of pressure. At each pressure the cell parameters are optimized and the σ-DOS, the *E₂g*-phonons and the electrical anisotropy of the σ-bands are calculated and, with the use of the Hopfield expression, are analyzed to see what the correlation of these elements with *T*ₐ is. [1] J Kortus, *Physica C* 456 (2007) 54-62 [2] U Esteves and P de la Mora, *Rev. Mex. Fis.* 53 (2007) 95-98

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