

Abstract Submitted
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Tracing the evolution of two energy gaps of MgB2 with increasing disorder MAURICIO ESCOBAR M., YONG-JIHN KIM, University of Puerto Rico — Previously we have determined the phonon-mediated matrix elements for MgB2 using the two band model and the scattered states. We noticed that, in the dirty limit, where the resistance ratio is about 3, the impurity scattering does not reduce the matrix elements much due to the Cooper pair size effect, whereas, in the weak localization limit, where the resistance ratio is less than 3, all the matrix elements are decreasing significantly due to weak localization. Now we calculate numerically the matrix elements and solve the gap equations with increasing disorder. We determine when the two energy gaps merge into one common energy gap and compare our calculations with experiments. We also calculate the transition temperature, T_c , as a function of the resistance ratio.

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