

Differential Conductance Measurements of MgB₂-Based Josephson Junctions Below 1 Kelvin

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Abstract - Magnesium diboride has many intriguing characteristics, including its relatively high critical temperature and two-band nature. Most prior studies of MgB₂ thin film Josephson junctions have been conducted above 2 Kelvin. We report results of sub-1 Kelvin experiments of MgB₂/insulator/Pb junctions whose a-b plane is exposed for electron tunneling. By measuring differential conductance at low temperature, new details in the structure of the sigma- and pi-band gaps are observed in this preliminary data, consistent with theoretical predictions.

Index Terms - Josephson junctions, Magnesium diboride, Superconducting films.

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