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Pressure effects on the superconductivity of Tl-2223 crystals¹ A O IJADUOLA, Department of Physics, University of North Georgia, R SHIPRA, Department of Physics and Astronomy, Vanderbilt University, A S SEFAT, MSTD, Oak Ridge National Laboratory — This study investigates the application of high pressure on the superconducting properties of a thallium-based cuprate namely $\text{Tl}_2\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10+\delta}$ (Tl-2223). The superconducting transition temperature (T_c) and the critical current density (J_c) were studied by applying 0.8 GPa of pressure. The pressure was applied in a piston-cylinder-cell (PCC), using Pb as manometer and Daphne 7373 oil as the pressure transmitting medium. For estimating the J_c , we used the Beans critical state formula on the magnetic hysteresis curves obtained at 10 K and 20 K. Both the T_c and J_c shifted with pressure, clearly indicating that pressure is another tool to control properties of quantum materials.

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