

Abstract Submitted  
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**Experimental and Theoretical Investigation of High Temperature Superconductors**<sup>1</sup> SCOTT DIETRICH, Boston University — The study includes ongoing physical measurements on High Temperature Superconducting (HTS) samples. A dual-coil apparatus, using BSCCO and YBCO samples, is used to measure the magnetic susceptibility, resistivity and other measurements of the samples. This allows for the inspection of the HTS material during its superconducting state, above the critical temperature and the region in between. Using this data, we hope to model the HTS material using a mathematically driven computer simulation. The simulation models the material as a matrix of Josephson Junctions and can apply the variables added in the lab, including electrical current, magnetic field, and temperature variation. The simulation aims at explaining the mechanisms behind high temperature superconductivity. Included in the program is the option to change lattice structures, giving the ability to explore theoretical HTS material compositions and preview their actions compared to the commonplace square lattice structures.

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