

Abstract Submitted
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Building and Testing a Superconductivity Measurement Platform for a Helium Cryostat¹ HEATH ROSE, JOSHUA OSTRANDER, JIM WU, ROBERTO RAMOS, Indiana Wesleyan University — Superconductivity experiments using Josephson junctions are an excellent environment to study quantum mechanics and materials science. A standard electrical transport technique uses filtered four wire measurement of these superconducting devices. We report our experience as undergraduates in a liberal arts college in building and testing an experimental platform anchored on the cold-finger of a helium cryostat and designed for performing differential conductance measurements in Josephson junctions. To filter out RF, we design, build and test cryogenic filters using ceramic capacitors and inductors and thermocoax cables. We also use fixed attenuators for thermal anchoring and use miniature connectors to connect wires and coax to a sample box. We report on progress in our diagnostic measurements as well as low-temperature tunneling experiments to probe the structure of the energy gap in both single- and multi-gapped superconductors.

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