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**Magnetic Properties of Iron Chalcogenide Superconducting Materials for Energy Storage Applications** DESTENIE KNOCK, KOREY POUGH, ABEBE KEBEDE, North Carolina A&T State University, DEREJE SEIFU, Morgan State University — A superconductor is characterized by its ability to conduct electricity without loss and expel magnetic flux when exposed to an external magnetic field. Additionally, the smaller the relaxation rate ($S$ =dM/dt), the better the material for energy storage. This research focuses on the recently discovered high-quality, single-crystalline Iron-based superconductors of $FeTe_{1-x}Se_x$ (x =0.5), with a transition temperature at $T_c$ =14.5K. Standard creep models are used to analyze the data and determine the effective pinning potential. The magnetization relaxation were measured the Superconducting Quantum Interference Device (SQUID). The relaxation rate appears to be independent of field and temperature for fields below 3T and temperatures below 7K. This result shows that the thermally activated flux motion is not as significant as in other high temperature superconductors, hence $FeTe_{1-x}Se_x$, can be a candidate for wire development to be used in Superconducting Magnetic Energy Storage systems.

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