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Dynamic flux-quantum phases in weak-pinning V_3Si and Re_3W
A. A. GAPUD, J. D. HEBERT, A. MORADMAND, P. SHRESTHA, A. KHAN, U. of South Alabama, Y. ZUEV, D. K. CHRISTEN, Oak Ridge National Laboratory, V. KUZNETSOVA, J. R. THOMPSON, U. of Tennessee — The dynamics of transport-driven flux quanta in the *absence* of pinning is a fundamental phenomenon little understood and studied by few. This is mainly because of a rarity of highly homogeneous type II samples with few pinning defects, combined with the technical challenge of passing high levels of transport current through such samples. These issues are addressed by the use of ultrasonically soldered leads and pulsed currents, in addition to the availability of relatively defect-free samples of the low-temperature superconductors, V_3Si and Re_3W. This enabled the study the critical-current "peak effect" in V_3Si [*PRB* **67**, 104516], which also included the observation of metastable phases in connection with the peak effect, still to be reported in greater detail. Another observation is that of dissipative flux flow phases, in both V_3Si and Re_3W, along with evidence of an *approach* towards the highly-ordered Bardeen-Stephen phase of free flux flow. The field dependence of free flux flow resistivity is also of interest in probing vortex *core size* effects [*PRB* **71**, 134505]. All of these are to be discussed in detail. *Research at ORNL supported by DOE Office of Electricity Delivery and Energy Efficiency and DOE Office of Science, Basic Energy Sciences.*

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