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Consistency of measured phase boundaries of the FFLO superconducting phase for different materials and types of probes CHARLES AGOSTA, Clark University, NATHANAEL FORTUNE, Smith College, SCOTT HANNAHS, JU-HYUN PARK, National High Magnetic Field Laboratory, JOHN SCHLEUTER, Argonne National Laboratory, LUCY LIANG, SHUYAO GAO, Smith College, LOGAN BISHOP-VAN HORN, MAX NEWMAN, Clark University, SHUYAO GU, Smith College, LUCY LIANG — New magnetocaloric and specific heat measurements of the high field superconducting state in the organic superconductor κ- (BEDT-TTF)$_2$Cu(NCS)$_2$ are compared to rf penetration depth, magnetic torque, and NMR measurements. The position of the phase lines separating the uniform superconducting state with the FFLO state and the normal state are mostly in good agreement with each other. The order of the phase transitions can only be determined from the calorimetric measurements and will be compared to theory. Results from other organic superconductors show that there is universal behavior. As an example, the distance between the lower and upper magnetic field phase line containing the FFLO state is proportional to the upper critical field. The position of the lower phase line, the Clogston Chandrasakar paramagnetic limit, will be compared to semi empirical calculations based on the specific heat for five different superconductors.

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