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Title:

Hall Effect Measurements on Ferromagnetic Superconductor UGe₂

Abstract:

"The coexistence of ferromagnetism and superconductivity requires an unconventional electron-pairing mechanism, since the conventional theory of opposite-spin Cooper pairs is ruled out by the spin-alignment due to the ferromagnetic order. In ferromagnetic superconductor UGe₂ the microscopic mechanism for superconductivity is as yet unknown, however the emergence of the superconducting state seems to be connected to the critical point where a metamagnetic transition between two different phases of ferromagnetism is suppressed, by high pressure, to zero Kelvin.

Hall effect and magnetoresistance measurements crossing this transition in temperature, pressure and magnetic field adds to our understanding of the nature of the different phases of ferromagnetism either side of the critical point and ultimately the nature of superconductivity in UGe₂. Here we report the significant changes in the ordinary and anomalous Hall coefficients crossing the metamagnetic transition."