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**Multiple Phase Transitions: Phase Diagram with Interacting Phase Boundaries of Different Order** BOHDAN ANDRAKA, PRADEEP KUMAR, University of Florida, AVADH SAXENA, Los Alamos National Laboratory — We present a thermodynamic discussion of the consequences of interacting phase boundaries. The particular focus here is when the superconducting phase boundaries are of different order in a phase diagram in the magnetic field-temperature (H-T) plane. Thus depending on the form of the dominant interaction, we derive thermodynamic observables such as specific heat, superfluid density (as could be measured by lower critical field) and thermal expansion as a function of field and temperature and especially their discontinuities at the phase boundaries. We suggest that these considerations have relevance for the superconducting transition and the phase diagram in PrOs<sub>4</sub>Sb<sub>12</sub>.

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