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Super-Symplectic spin and heavy fermion systems ALINE RAMIRES, PIERS COLEMAN, Rutgers University — Heavy fermion materials are systems in which the presence of local moments leads to new physics. The phase diagram of these systems is very rich, usually presenting an antiferromagnetic (AFM) phase, a heavy Fermi liquid regime (HFL), and non Fermi-liquid behavior above the AFM quantum critical point (QCP). Our understanding of what happens to the local moments in different extremes of this phase diagram is based in two different representation for the spin: a Schwinger boson representation, appropriate for the description of AFM, and an Abrikosov fermion representation, suitable for the understanding of the HFL development. The theoretical approaches to this problem so far have been restricted to describe only extremes of this phase diagram, and are not reliable for the description of the more interesting region of the diagram, around the QCP. In this region the magnetic and Kondo energy scales interplay and can lead to dramatic changes in the character of the quantum phase transition. Here we use supersymmetric symplectic spins in order to investigate this intermediate regime.

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