

Anderson-Morel path to unconventional Kondo states from non-local ferromagnetic Kondo exchange

E. Scott,¹ Y. Chen,² M. Turaev,³ T. Yzeiri,^{4,5} C. Hooley,⁶ K. P. Wojcik,⁷
and M. P. Kwasigroch^{1,8}

¹*Department of Mathematics, University College London*

²*Department of Physics, Kings College London*

³*Physikalisches Institut, Universität Bonn*

⁴*London Centre for Nanotechnology, University College London*

⁵*ISIS Facility, Rutherford Appleton Laboratory*

⁶*Centre for Fluid and Complex Systems, Coventry University*

⁷*Institute of Molecular Physics, Polish Academy of Sciences*

⁸*Trinity College, Cambridge*

In a remarkable analogy with the Anderson-Morel model of superconductivity, we show that a non-local ferromagnetic (FM) Kondo exchange can lead to a singlet Kondo groundstate if a small Anderson-Morel-like reduction in the FM coupling is introduced that couples only low-energy electrons. We observe this behaviour in the single impurity and lattice Kondo models. In analogy with unconventional superconductivity, we explore the possibility of unconventional Kondo states, particularly in the vicinity of quantum critical points.