Multichannel Kondo Models in non-Abelian Quantum Hall Droplets

GREGORY A. FIETE, University of Texas at Austin, WAHEB BISHARA, California Institute of Technology, CHETAN NAYAK, Microsoft Station Q and Department of Physics, UCSB — We study the coupling between a quantum dot and the edge of a non-Abelian fractional quantum Hall state which is spatially separated from it by an integer quantum Hall state. Near a resonance, the physics at energy scales below the level spacing of the edge states of the dot is governed by a $k$-channel Kondo model when the quantum Hall state is a Read-Rezayi state at filling fraction $\nu = 2 + k/(k+2)$ or its particle-hole conjugate at $\nu = 2 + 2/(k+2)$. The $k$-channel Kondo model is channel isotropic even without fine tuning in the former state; in the latter, it is generically channel anisotropic. In the special case of $k = 2$, our results provide a new venue, realized in a mesoscopic context, to distinguish between the Pfaffian and anti-Pfaffian states at filling fraction $\nu = 5/2$.