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Kondo and Majorana doublet interactions in quantum dots YOUNGHYUN KIM, UC Santa Barbara, DONG E. LIU, Microsoft Research Station Q, ERIKAS GAIDAMAUSKAS, JENS PAASKE, KARSTEN FLENSBERG, Niels Bohr Institute, University of Copenhagen, ROMAN LUTCHYN, Microsoft Research Station Q — We study the properties of a quantum dot coupled to a normal lead and a time-reversal topological superconductor with Majorana Kramers pair at the end. We explore the phase diagram of the system as a function of Kondo and Majorana-induced coupling strengths using perturbative renormalization group study and slave-boson mean-field theory. We find that, in the presence of coupling between a quantum dot and a Majorana doublet, the system flows to a new fixed point controlled by the Majorana doublet, rather than the Kondo coupling, which is characterized by correlations between a localized spin and the fermion parity of each spin sector of the topological superconductor. We find that this fixed point is stable with respect to Gaussian fluctuations. We also investigate the effect of spin-spin interaction between a quantum dot and Majorana doublet and compare the result with a case where a normal lead is directly coupled to Majorana doublet.

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