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Skyrmion-induced Bound States in Superconductors[1] SHO NAKOSAI, RIKEN, SERGEY PERSHOGUBA, Nordia, ALEXANDER BALATSKY, Nordita, Los Alamos National Laboratory — We consider superconducting systems proximity-coupled to magnetic materials with skyrmion structures. Motivated by the progress in experiments which allows us to control the magnetic textures, we consider the case where a single skyrmion is floating in ferromagnetic background. We predict the skyrmion bound state is formed around the core of it. The results are obtained through the numerical calculation on the spin-polarized local density of states in the vicinity of the skyrmion core, which shows good agreement with T-matrix analysis. The bound states can be recognized as skyrmion-version of well-known Yu-Shiba-Rusinov states.

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