Electronic and Magnetic Character of UTe_2 Unconventional Superconductor

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The interplay between ferromagnetism and superconductivity is a challenging problem in the coupling between the two major states of condensed matter. Recently discovered UTe2 superconductor with T_c =1.7 K [1,2] had originally been suggested to provide a new phase of superconducting matter in which half of the electrons become superconducting and half remain normal (thus with Fermi surfaces). In more recent studies down to 50 mK [3] strong evidence was presented for *p*-wave triplet pairing with point nodes. This behavior brings to mind the U-based ferromagnetic superconductors, with the difference that no long-range magnetic order has been observed in UTe2 down to 25 mK.

We report density functional theory plus Hubbard U calculations for UTe2 superconductor. We make a comparison between the electronic structure and spin and orbital magnetic properties of UTe2 and UGe2. We show that the Fermi surfaces display low dimensional features, reminiscent of the UGe2 [4].

References

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