Spin-triplet *p*-wave pairing in quasi-one-dimensional superconductors

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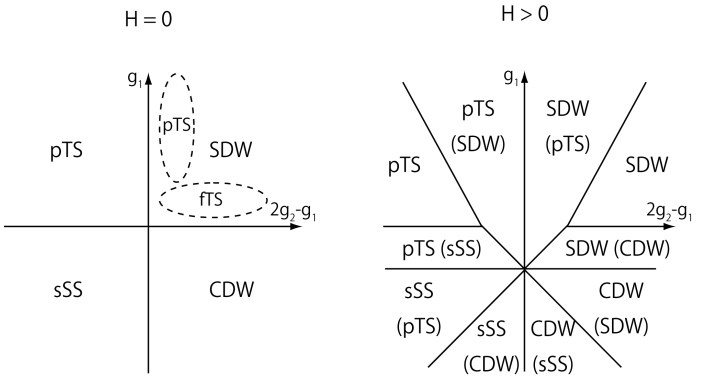
We propose a new mechanism of spin-triplet *p*-wave pairing in quasi-1D systems on the basis of the renormalization group technique for quasi-1D [1]. With this mechanism, a transition from SDW to *p*-wave triplet superconductivity (*p*TS) is possible under a magnetic field. The mechanism of this *p*TS is completely different from that of *f*-wave triplet paring previously investigated [2-5].

In terms of the *g*-ology for 1D, the SDW state realizes for $2g_2$-g_1>0, and g_1>0 (see the left panel). When we apply a magnetic field, the instability of *p*TS increase as a subdominant instability near $2g_2$-g_1~0 (the right panel). The present mechanism uses this instability of "percolated" *p*TS. In the case of quasi-1D with bad nesting-condition, the instability of SDW is suppressed, so that the *p*TS is realized. Basically, this *p*TS does not need any density-wave fluctuation. This is completely different from the previous *f*TS, where it needs density-fluctuations of SDW and CDW.



Phase diagram of 1D electron system for H=0 (left) and H>0 (right). The states in the brackets denote subdominant instabilities. The states in the dashed oval denote the possible pairing in quasi-1D.

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