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Phase diagram of (TMTSF)2PF6 revisited[1] LEV GOR'KOV, NHMFL, Florida State University, PAVEL GRIGORIEV, NHMFL, Florida State University and Landau Institute, PAVEL KROTKOV, University of Maryland — The antiferromagnetic spin-density wave (SDW) as function of pressure reveals an appearance of a quantum critical point embedded in a low-temperature superconducting (SC) phase. This diagram is commonly interpreted in terms of the tight-binding Q1D model with an antinesting term $t'_b(p_\perp)$ dependence on which simulates changes in electronic spectrum with pressure. The model predicts two SDW phases with different SDW vectors [1] and second-order transitions between SDW and metallic states. Recent experiments have shown that the transition is actually of the first order and, what is even more surprising, the phase adjacent to the metallic phase bears the character of a periodic domain structure (both above and inside the SC state) [2]. The revision of the problem has led us first to the conclusion that the claim of [1] concerning two SDW vectors is incorrect, and second, that the model itself has some flaws. Being slightly modified the model may lead to a more complicated behavior of SDW near the critical point. Physical mechanisms for the periodic domain formation are discussed. [1] Y.Hasegawa and H.Fukuyama, J. Phys. Soc. Jap. 55, 3978 (1986); [2] T.Vuletic et al., Eur. Phys. J. B 25, 319 (2002); I.J.Lee et al., Phys. Rev. Lett. 88, 207002 (2002)

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