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Quantum phase transitions and non-uniform phases in low-dimensional superconductors[1] WEI ZHANG, CARLOS SA DE MELO, Georgia Institute of Technology — We discuss the possibility of coexistence of spin density wave (SDW) or antiferromagnetism (AF) and triplet superconductivity (TS) as a particular example of a broad class of systems where the interplay of magnetism and superconductivity is important. We focus on the case of quasi-one-dimensional metals, where it is known experimentally that SDW (AF) is in close vicinity to TS in the temperature versus pressure phase diagram. We use the functional integral method to derive an effective field theory describing the interplay between SDW (AF) and TS orders. Furthermore, we establish conditions for the existence of two quantum critical points (QCP's) in the pressure versus temperature phase diagram. The first QCP is between a pure SDW (AF) phase and a non-uniform phase (NUP) consisting of alternating insulating SDW (AF) and TS stripes. The second QCP is between the NUP and a pure TS phase. The NUP exists between the two QCP's and is favored over a narrow range of pressure.

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