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Evidence for phase separation between the co-existing Density Wave and Superconducting orders in $(TMTSF)_2PF_6$ ARJUN NARAYANAN, PAUL CHAIKIN, Physics Department, New York University — Resistance, Thermopower and Angular Dependent Magnetoresistance(AMRO) measurements were used to study the organic conductor $(TMTSF)_2PF_6$ at pressures where co-existence between Superconducting and Spin Density Wave orders occurs. While in other material families such coexistence is poorly understood, in $(TMTSF)_2PF_6$ a clear picture is emerging. Various suggestions had been made regarding the coexistence phase, including homogenous phases showing microscopic coexistence, Soliton walls in Density Waves, and phase separation between normal metal and density wave regions. *We provide strong evidence for the phase separation scenario in $(TMTSF)_2PF_6$.* The existence of domains and their pattern of distribution are unambiguously evidenced by thermopower and resistivity anisotropies. The metallic domains are identified as the regular high pressure metal by various unique signatures such as Field Induced Density Waves(FISDW), AMRO and the superconducting Tc. Some surprising details of the evolution of FISDW and AMRO with pressure in the coexistence phase will also be discussed.

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