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Ordering and Frustration in a Strongly Correlated Chain system SIDDHARTHA LAL, Department of Physics, University of Illinois at Urbana-Champaign, MUKUL LAAD, Max Planck Institute for Complex Systems, Dresden, Germany — We present recent results of our study on the one-dimensional extended Hubbard model with longer-range Coulomb interactions at quarter-filling in the strong coupling limit. With the complex phase diagram of the TMTSF and TMTTF organic charge transfer salts as motivation, we explore the possible charge and spin ordered states that arise from frustrating interactions. We find a quantum critical point in the phase diagram of the single chain and present results for some response functions in the quantum critical regime. RPA studies of coupled chains reveal a phase diagram with the ordered phase extended to finite temperatures and a phase boundary again ending at a quantum critical point. Critical quantum fluctuations at the QCP enhance the transverse dispersion, leading to a dimensional crossover and a low temperature transition from insulating chains to anisotropic metallic bulk behaviour. These results have been reported in arxiv:0708.2156 and are in press at Int. J. Mod. Phys. B.

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