Precursors of 1D behavior for $D > 1$: evolution of the non-analytic correction to the Fermi-liquid behavior RONOJOY SAHA, DMITRII MASLOV, Dept. of Physics, University of Florida, Gainesville, Florida 32611-8440, USA — The Fermi-liquid forms of the specific heat ($C(T)$) and static spin susceptibility ($\chi_s$) acquire universal non-analytic corrections[1] and the degree of non-analyticity increase inversely with the dimensionality. This predicts that the strongest non-analyticity in the specific heat should be found in 1D, however bosonization shows that $C(T)$ is linear in $T$ in 1D. We resolve this paradox by showing that the general argument, for non-analyticity in $D > 1$ at the second order in the interaction, breaks down in 1D due to a subtle cancellation and the non-analytic $T \ln T$ term in 1D occurs at the third order for electrons with spin. We obtain the same result by considering the RG flow of the marginally irrelevant operator in the sine-Gordon theory. For spinless electrons, the non-analyticities in the particle-particle and particle-hole channels cancel out and the resulting $C(T)$ is linear in $T$. The singularity in the particle-hole channel causes non-analyticity in the spin susceptibility $\chi_s \propto \ln \max\{|Q|, |H|, T\}$ present at the second order[2].