

Title: Holographic Entanglement Entropy and Mutual Information for the Strongly Coupled Plasma

Abstract: We investigate analytically, in the specific regimes of parameters, how entanglement entropy and mutual information behave near the critical point. Interestingly, we observe that the slope of mutual information with respect to temperature or chemical potential shows a power-law divergence with the exponent $\alpha=1/2$ in the vicinity of the critical point. We will argue that beside the numerous merits of mutual information, this quantity also captures the critical behavior of the underlying field theory and it could be used as a proper measure to probe the phase transitions associated with the strongly coupled systems.