HIGHER POINT CONFORMAL BLOCKS, MUTUAL INFORMATION AND HEAVY QUENCHES

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Abstract

We consider Virasoro conformal blocks of two heavy operators and an arbitrary number of light operators in a CFT with large central charge. Using the monodromy method and without any assumptions on the spectrum and OPEs, these higher-point conformal blocks are shown to factorize into products of 4-point conformal blocks in the heavy-light limit for a class of OPE channels. This result is reproduced by considering suitable worldline configurations in the bulk conical defect geometry. We apply these results to calculate the entanglement entropy and mutual information of an arbitrary number of disjoint intervals for heavy states and study local quenches. The corresponding holographic entanglement entropy calculated via the minimal area prescription precisely matches these results from CFT. Along the way, we illustrate the relation of these conformal blocks to Riemann surfaces and their associated moduli space.

Based on work (to appear) with Pinaki Banerjee and Ritam Sinha.