

Operator spectrum of nonrelativistic CFTs at large charge

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I will discuss the large-charge expansion of the conformal dimension Δ_Q of the lowest operator of charge Q in nonrelativistic CFTs using the state-operator correspondence. The latter requires coupling the theory to an external harmonic trap that confines the particles to a spherical cloud, at the edge of which the effective theory breaks down and leads to divergences. Only recently has this issue been overcome by constructing appropriate counterterms at the edge of the cloud. I will show how to extend these results by systematically analyzing the degree of divergence of operators in the effective action and show that there always exist appropriate edge counterterms that make the final contributions to Δ_Q finite. On the other side of the correspondence, this also provides new corrections to the Thomas-Fermi approximation of the unitary Fermi gas, and I will comment on their relevance for ultracold atom physics.

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