Holographic Solitons and the AdS/CFT Correspondence

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Abstract:

One of the most exciting recent theoretical developments has been the evolution of the holographic gauge/gravity duality. This duality relates the behavior of a strongly coupled field theory to string theory in a higher dimensional space [1]. In the last few years there have attempts to construct holographic models of superfluidity using these tools [2]. Because the duality generally involves both bosonic and fermionic fields, the precise character of the superfluid’s low lying excitations is quite complicated and still largely unknown.

After reviewing the basic structure of the gauge/gravity duality and holographic superfluidity, we will discuss dark soliton and vortex solutions in the gravitational theory. By tuning parameters in the gravitational theory, it is possible to model features of solitons in both fermionic and bosonic superfluids.

References: