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Dynamics of superconducting interfaces

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An influential paper of E Witten in the mid '80s introduced models for superconducting cosmic strings, a hypothetical class of objects of possible cosmological significance. So far there is little rigorous mathematical work related to these models, and their complexity makes any potential mathematical analysis a forbidding challenge. We will describe some results about superconducting interfaces (rather than strings).

These exhibit many of the same features as superconducting cosmic strings, but in a setting in which one can more easily isolate the main mathematical issues. In particular we will describe a (rigorous) effective law of motion for the dynamics of these objects, one that differs noticeably from predictions found in the physics literature.

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