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Magnetised Bounds for Conformal Field Theories

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External probes of conformal field theories (CFTs) introduce novel observables and provide new insights into their structure. Well-known examples include CFTs in curved space, at finite temperature, or with a non-zero chemical potential. A key tool in this exploration is the low-energy effective action, which can be systematically constructed using symmetry principles. In this talk, we will focus on three-dimensional CFTs with a global U(1) symmetry coupled to a background magnetic field. Assuming that the magnetic field drives the CFT to a gapped phase, we will examine the associated effective action and use it to define two-point functions of the conserved current and stress-energy tensor. Leveraging dispersive arguments, we will derive constraints on the effective action coefficients and explore their implications for physically relevant observables.

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