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Non-Renormalization of the Anomalies and Universality in Transport Coefficients

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Anomalies are the breaking of classical symmetries by quantum effects, and their non-renormalization properties play a crucial role in a wide range of phenomena. I present some rigorous theorems on the (non-perturbative) anomaly non-renormalization in QFT models, based on Renormalization Group, cluster or tree expansion and determinant bounds, proving the exact cancellation of the terms coming by the lattice cut-offs. I discuss in particular a lattice fermion-vector model in $d = 3 + 1$, the Sommerfield model in $d = 1 + 1$ and the anomaly cancellation in a chiral lattice $d = 3 + 1$ model. Analogous results on universality in transport coefficients in graphene, Hall insulators and Weyl semimetals in presence of a many body interactions will be also briefly presented.

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