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Open Wilson chains for quantum impurity models: Keeping track of all bath modes JAN VON DELFT, BENEDIKT BRUOGNOLO, NILS-OLIVER LINDEN, FRAUKE SCHWARZ, KATHARINA STADLER, ANDREAS WEICHSELBAUM, Ludwig-Maximilians-University Munich, FRITHJOF B. ANDERS, Technische Universitt Dortmund, MATTHIAS VOJTA, Technische Universitt Dresden — When constructing a Wilson chain to represent a quantum impurity model, the effect of truncated bath modes is neglected. We show that their influence can be kept track of systematically by constructing an "open Wilson chain" in which each site is coupled to a separate effective bath of its own. This strategy enables us to cure the so-called mass-flow problem that can arise when using standard Wilson chains to treat impurity models with asymmetric bath spectral functions at finite temperature. We demonstrate this for the strongly sub-Ohmic spin-boson model at quantum criticality where we directly observe the flow towards a Gaussian critical fixed point.

Jan von Delft
Ludwig-Maximilians-University Munich

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