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Reanalysis of critical exponents for the O(N) model via a hydrodynamic approach to the Functional Renormalization Group

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We compute the critical exponents of the O(N) model within the Functional Renormalization Group (FRG) approach. We use recent advances which are based on the observation that the FRG flow equation can be put into the form of an advection-diffusion equation. This allows to employ well-tested hydrodynamical algorithms for its solution. In this study we work in the local potential approximation (LPA) for the effective average action and put special emphasis on estimating the various sources of errors. Our results complement previous results for the critical exponents obtained within the FRG approach in LPA. Despite the limitations imposed by restricting the discussion to the LPA, the results compare favorably with those obtained via other methods.

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