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The Phase Diagram of the Gross-Neveu-Yukawa Modell in (2+1) Space-Time Dimensions using Functional Renormalization Group

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In this study, the phase structure of the Gross-Neveu-Yukawa model in $(2 + 1)$ dimensions for μ and T is explored. This work complements previous works in 1+1 dimensions for finite N and 2+1 mean field as well as finite N_f results (at zero chemical potential). The Functional Renormalization Group is used to calculate the effective potential. With the use of the Local Potential Approximation (LPA), the computation of the effective action can be further simplified to a diffusion type equation with a sink/source. The resulting heat equation is then solved with existing hydrodynamic solving techniques. With this setup, the phase diagram in the μ-T plane is calculated.

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