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Hadronic Spectral Functions at Finite Temperature and Density

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We have recently developed a new method to obtain real-time quantities such as spectral functions or transport coefficients at finite temperature and density within a non-perturbative Functional Renormalization Group approach [1]. Our method is based on a thermodynamically consistent truncation of the flow equations for 2-point functions with analytically continued frequency components in the originally Euclidean external momenta. The feasibility of the method is demonstrated at the example of the mesonic spectral functions in the quark-meson model at different temperatures and quark chemical potentials, in particular around the critical endpoint in the phase diagram of the model. An extension of the method to finite spatial momenta [2] furthermore allows to compute transport coefficients such as the shear viscosity and the shear viscosity over entropy-density ratio at finite temperature and density.

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[1] R.-A. Tripolt, N. Strodthoff, L. von Smekal, and J. Wambach, Phys. Rev. D 89 (2014) 034010.

[2] R.-A. Tripolt, L. von Smekal, and J. Wambach, Phys. Rev. D 90 (2014) 0774031.

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