Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Transport coefficients in the linear sigma model with massive particles[1] MATTHEW HEFFERNAN, SANGYONG JEON, CHARLES GALE, McGill University — The remarkable achievements of the RHIC and LHC programs have raised the hope that transport coefficients of QCD can be extracted from heavy-ion data. Now that simulations have shown that the value of shear and bulk viscosity influence measured spectra, we must study the transport coefficients quantitatively and restrict the parameter space. We present an extended framework for calculating transport coefficients in the linear sigma model, which incorporates vacuum masses and thermal masses arising from mean field effects and showcases many features of strongly interacting systems. We calculate the electrical conductivity and the shear and bulk viscosity of strongly interacting matter in the relaxation time approximation, and the shear viscosity and electrical conductivity using a variational expansion. Our calculations with vacuum sigma masses consistent with the that of f0(500) correspond well to the results and behavior of previous pion gas calculations obtained via completely different techniques, and with expectations from pQCD. We discuss subtleties arising in exact calculations of the bulk viscosity within our framework. Finally, we present a review of existing results and point out avenues of future research.

[1]This work was supported in part by the Natural Sciences and Engineering Research Council of Canada. Computations were made on Beluga, managed by Calcul Quebec and Compute Canada and funded by the Canada Foundation for Innovation (CFI), Ministere de lEconomie, des Sciences et de lInnovation du Quebec (MESI) and FRQ-NT.

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Date submitted: 27 Jun 2019 Electronic form version 1.4