

Abstract Submitted
for the DNP08 Meeting of
The American Physical Society

Sorting Category: 11. (T)

A Random Matrix Study of the QCD Sign Problem¹

JILONG HAN, MIKHAIL STEPANOV, Department of Physics, University of Illinois, Chicago, USA — We investigate the severity of the sign problem in a random matrix model for QCD at finite temperature T and baryon chemical potential μ . We obtain analytic expression for the average phase factor – the measure of the severity of the sign problem at arbitrary T and μ . We observe that the sign problem becomes less severe as the temperature is increased. We also find the domain where the sign problem is maximal – the average phase factor is zero, which is related to the pion condensation phase in the QCD with finite isospin chemical potential. We find that, in the matrix model we studied, the critical point is located inside the domain of the maximal sign problem, making the point inaccessible to conventional reweighting techniques. We observe and describe the scaling behavior of the size and shape of the pion condensation near the chiral limit.

¹This research is supported by the DOE grant No. DE-FG0201ER41195.

Prefer Oral Session
 Prefer Poster Session

Jilong Han
jhan13@uic.edu
Department of Physics, University of Illinois, Chicago, USA

Date submitted: 03 Jun 2008

Electronic form version 1.4