Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

The Zero Mode Effect on Critical Coupling for 1+1 ϕ^4 Theory[1]
MENGYAO HUANG, SHREERAM JAWADEKAR, MAMOON SHARAF, JAMES VARY, Iowa State University — Evaluating the effect of the zero momentum mode in discretized light cone quantization (DLCQ) approach for light front field theory is a long standing problem. Using 1+1 dimension ϕ^4 theory, we compare the critical coupling calculated in light front with zero mode excluded and included. The critical coupling without zero mode was previously obtained by solving the theory in DLCQ, and the critical coupling with zero mode included was recently obtained by solving the theory in light front using a symmetric polynomial basis which was claimed to circumvent the zero mode problem [1]. The critical coupling from these two methods can be compared, and conclusion can be drawn on whether the zero mode has a significant effect for the DLCQ critical coupling result. We then further compare the zero mode included and excluded cases after their critical coupling is converted to the corresponding value in equal time scheme. Finally, we discuss the consistency of these converted values with critical coupling obtained by equal time quantization approaches in literature. [1] M. Burkardt, et al., Phys. Rev. D94, 065006(2016)

[1]Supported by the Department of Energy under Grants No. DE-FG02-87ER40371 and DE-SC0018223 (SciDAC-4/NUCLEI). Computational resources were provided by NERSC, which is supported by the US DOE Office of Science.

Mengyao Huang
Iowa State University

Date submitted: 25 Jun 2020 Electronic form version 1.4