MP 14: Poster 2

Zeit: Donnerstag 8:00–18:00 Raum: Poster OG

MP 14.1 Do 8:00 Poster OG

N=1 Supersymmetric Yang-Mills Theory on the Lattice — Georg Bergner[1], Istvan Montvay[2], Gernot Münster[3], •Umut D. Özugurel[3], Stefano Piemonte[3], and Dirk Sandbrink[3] — [1]ITP GU Frankfurt — [2]DESY Hamburg — [3]ITP WWU Münster

N=1 supersymmetric Yang-Mills theory describes the interactions between gluons and their superpartners, spin 1/2 gluinos. The spectrum of the theory consists of many composite particles, such as glueballs, mesons and mixed gluinos and gluons. In a supersymmetric model, particles which belong to the same supermultiplet must have the same mass. In order to show this feature, we study the theory with non-perturbative methods, by discretizing spacetime on an hypercubic lattice and introducing a small gluino mass. This leads to a breaking of supersymmetry, but allows us to study the theory on a computer with Monte Carlo simulations. Supersymmetry is expected to be recovered in the continuum limit and with a vanishing gluino mass. We report that 2 types of mesons and a spin 1/2 gluino-glueball are found as expected to have approximately the same mass and we discuss possible sources of deviation from exact supersymmetry. We also describe some numerical techniques that we developed and used.

MP 14.2 Do 8:00 Poster OG

Practice-oriented Examples for Eigenmode Computation Using Perturbative Methods — •Korinna Brackebusch and Ursula van Rienen — University of Rostock, Rostock, Germany

Parametric studies of geometric variations are an essential part of the performance optimization and error estimation in the design of accelerator cavities. Using common eigenmode solvers the analysis of intentional and undesired geometric perturbations tend to be very extensive since any geometric variation involves an entire eigenmode recomputation. Perturbative methods constitute an efficient alternative for the computation of a multitude of moderately varying geometries. Their practicability was proven by means of simple cavity geometries.

In this paper we investigate the applicability and efficiency for practice-oriented cavity structures. For this, basic geometric parameters of the cavity are varied and the respective eigenmodes are computed by using perturbative as well as common methods. The accuracy of the results and the computational effort of the different methods are compared.

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