

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 25.06.2015, 16¹⁵ Uhr

Seminarraum 127, TUM, Physik II, Erdgeschoss/Nord
Treffen zum gemeinsamen Kaffee 16 Uhr

Hector Martinez

(Physik Department T30f, TU München)

Phenomenology of the heavy quarkonium electric dipole transitions

We use the complete expression for the $1/m^2$ corrections to the quark-antiquark potential derived from QCD in terms of Wilson loop expectation values, and a mapping valid at large distances, between those Wilson loop expectation values and correlators evaluated in the effective string theory (EST), to compute all $O(1/m^2)$ potentials at large distances. In particular, we present previously unknown results for the spin-independent part of the potential and confirm known results for the spin and momentum dependent parts. We discuss the power counting and numerical size of these new corrections. Using the EST long-distance contributions as the infrared completion of the potential we calculate the corrections induced by these to the heavy quarkonium wavefunction. Finally, considering these corrections, we evaluate the heavy quarkonium electric dipole (E1) transition rates at NLO in the relativistic expansion. We show that our results compare favorable with the experiment and provide predictions for the rates for which no experimental data is yet available.

gez. Peter Thirolf
Tel. 289-14064

gez. Norbert Kaiser
Tel. 289-12367