Contribution ID: **41**   Type: **Oral Presentation**

Quantum Corrections to the Kink-Antikink Potential

Tuesday, 5 July 2016 10:20 (20 minutes)

**Abstract content
   (Max 300 words)
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In field theory vacuum polarization effects may significantly alter classical predictions for non-perturbative configurations. This is particularly the case when comparing the vacuum polarization energy (VPE) of different topological sectors that represent different particle numbers. For this reason we calculate the VPE of the kink-antikink interaction in models with one time and one space dimension. We compute the VPE from the spectral method. This approach makes heavy use of scattering data for fluctuations around the non-perturbative background configuration. In a first step we compare our numerical results for the (anti)kink background in the phi;⁴ and sine-Gordon models to analytical results from the literature. In the next step the VPE is computed for backgrounds that have a kink and antikink at a certain separation. Since each calculation is done at a fixed separation, we must exclude quantum fluctuations from modes which correspond to the variation of this separation. This enforces an orthogonality constraint in the symmetric channel. Ultimately, the first order quantum correction to the kink-antikink potential is extracted from the calculation of the VPE.

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MSc

**Main supervisor (name and email)
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Session Classification: Theoretical and Computational Physics (1)

Track Classification: Track G - Theoretical and Computational Physics

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Track Classification: Track G - Theoretical and Computational Physics