



Contribution ID: 241

Type: **not specified**

## Heavy Quark Dynamics from Entropy shifts

Tuesday 30 August 2016 21:20 (20 minutes)

The presentation is based on these works

1) Heavy Quark Entropy shift: From the Hadron Resonance Gas to Power Corrections

By E. Megias, E. Ruiz Arriola, L.L. Salcedo.

arXiv:1605.04453 [hep-ph].

2) Heavy quark-antiquark free energy and thermodynamics of string-hadron avoided crossings

By E. Megias, E. Ruiz Arriola, L.L. Salcedo.

arXiv:1603.04642 [hep-ph].

3) Heavy  $\bar{Q}Q$  free energy from hadronic states

By E. Megias, E. Ruiz Arriola, L.L. Salcedo.

arXiv:1507.08606 [hep-ph].

10.1016/j.nuclphysbps.2016.02.034.

Nucl.Part.Phys.Proc. 93-97 270-272, Nucl.Part.Phys.Proc. 270-272 (2016) 170-174.

4) Quark properties from the Hadron Resonance Gas

By E. Ruiz Arriola, L.L. Salcedo, E. Megias.

arXiv:1505.02922 [hep-ph].

10.5506/APhysPolBSupp.8.439.

Acta Phys.Polon.Supp. 8 (2015) no.2, 439.

5) Quark Hadron Duality at Finite Temperature

By E. Ruiz Arriola, L.L. Salcedo, E. Megias.

arXiv:1410.3869 [hep-ph].

10.5506/APhysPolB.45.2407.

Acta Phys.Polon. B45 (2014) no.12, 2407-2454.

### Summary

The correlation function between two Polyakov loops encodes the free-energy shift due to a pair of separated colour conjugated sources in the hot QCD vacuum. This is analyzed in terms of a novel Källén-Lehmann spectral representation for the separating distance, implying an increasing and concave free-energy at all temperatures. We express the heavy  $Q\bar{Q}$  entropy shift below the phase transition in QCD in terms of colour neutral purely hadronic states with no explicit reference to quarks and gluons. Good agreement with lattice data is achieved when considering the avoided crossing mechanism underlying string breaking and with standard quenched values of the string tension known from charmonium and bottomonium phenomenology.

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**Session Classification:** Poster Session and Wine Tasting

**Track Classification:** Poster session