



Contribution ID: 37

Type: **Talk**

## Chiral dynamics in the low-temperature phase of QCD

*Thursday, 2 July 2015 17:10 (20 minutes)*

We investigate the low-temperature phase of strongly interacting matter and the crossover region with two light flavors of quarks in Lattice QCD. Based on Chiral Ward Identities we test the applicability of a fixed-temperature chiral expansion given that chiral symmetry is spontaneously broken. It indicates that a sharp real-time excitation persists with the quantum numbers of the pion consistently with Goldstone's theorem even at  $T=150$  MeV. We determine the real part of the pole and its residue in the axial-charge density correlator at zero and finite momentum. The time-dependent correlators are also analyzed using the Maximum Entropy method and the Backus-Gilbert method yielding consistent results. In addition, we also test the predictions of ordinary chiral perturbation theory around the point  $(T=0, m=0)$  for the temperature dependence of static observables. Around the crossover region, we find that all quantities considered depend only mildly on the quark mass in the range  $8 \text{ MeV} \leq \overline{m}^{\overline{MS}} \leq 15 \text{ MeV}$ .

**Primary author:** ROBAINA, Daniel (Institute of Nuclear Physics, Mainz)

**Co-authors:** Dr FRANCIS, Anthony (University Toronto); Dr BRANDT, Bastian (University of Regensburg); Prof. MEYER, Harvey B. (Institute of Nuclear Physics Mainz)

**Presenter:** ROBAINA, Daniel (Institute of Nuclear Physics, Mainz)

**Session Classification:** Parallel Session 6 - Goldstone Boson WG

**Track Classification:** Goldstone Boson Working Group