## 9th International Conference on New Frontiers in Physics (ICNFP 2020)



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Type: Talk

# Electric conductivity in gauge theory with finite-density dynamical fermions

Tuesday 8 September 2020 10:00 (30 minutes)

We study the dependence of electric conductivity on fermion chemical potential in finite-density SU(2) gauge theory with  $N_f = 2$  flavours of rooted staggered sea quarks and with Wilson-Dirac and Domain Wall valence quarks. We concentrate in particular on the vicinity of the crossover between the high-temperature and the low-temperature regimes, where we find the low-frequency electric conductivity to be most sensitive to small changes in fermion density. An estimate of the second derivative  $\frac{T^2}{\sigma} \frac{\partial^2 \sigma}{\partial \mu^2} \sim 0.05$  is obtained. On the other hand, in the diquark condensation phase at low temperatures and large values of  $\mu$  the conductivity quickly grows with chemical potential. As a by-product of our study we confirm the conclusions of previous studies with higher pion masses that for SU(2) gauge theory the ratio of crossover temperature to pion mass  $T_c/m_{\pi}$ is significantly smaller than in real QCD.

#### Is this abstract from experiment?

No

### Name of experiment and experimental site

N/A

## Is the speaker for that presentation defined?

Yes

## Details

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