



Contribution ID: 16

Type: **not specified**

Quark mass functions and pion structure in the Covariant Spectator Theory

We introduce a covariant approach in Minkowski space for the description of quarks and mesons that exhibits both chiral-symmetry breaking and confinement. Our quark-antiquark interaction kernel is the sum of a one-gluon exchange and a covariant generalization of the linear confining interaction. We assume a Lorentz vector structure for the one-gluon-exchange and a mixed equally-weighted scalar-pseudoscalar structure for the confining part. The kernel preserves the axial- vector Ward-Takahashi identity and our model complies with the Adler zero constraint for π - π -scattering imposed by chiral symmetry.

Using this method, we have calculated the dressed quark mass function in Minkowski space. In order to compare with Euclidean approaches, our mass function is analytically continued to the region of negative four-momenta squared, where it is fitted to the existing lattice QCD data.

As a first application the mass function is used, together with a dressed off-shell quark current that satisfies the vector Ward-Takahashi identity, in the calculation of the pion electromagnetic form factor.

Primary author: BIERNAT, Elmar (Instituto Superior Tecnico, Universidade de Lisboa)

Co-authors: Prof. GROSS, Franz (Thomas Jefferson National Accelerator Facility (JLab), Newport News, Virginia 23606, USA and College of William and Mary, Williamsburg, Virginia 23188, USA); Prof. PEÑA, Teresa (CFTP, Instituto Superior Tecnico (IST), Universidade de Lisboa); STADLER, Alfred (University of Évora); LEITÃO, Sofia (IST)

Presenter: BIERNAT, Elmar (Instituto Superior Tecnico, Universidade de Lisboa)