



Contribution ID: 33

Type: **not specified**

Quark-Hadron duality in Deep Inelastic Scattering

Monday, 19 November 2018 16:40 (25 minutes)

High energy inclusive processes are naturally formulated in terms of partonic distributions, but in fact all exclusive processes correspond to resonances and completeness of states requires a non-trivial relation between inclusive and exclusive measurements. We review how Quark-Hadron Duality (QHD) for (u,d) flavors at high energies and in the scaling regime suggests a radial and angular behaviour of mesonic and baryonic resonance masses of the Regge form $M_{2n}^2 = \mu_{2n}^2 + \beta_{2n} J + M_0^2$. The radial mass dependence is asymptotically consistent with a common two-body dynamics for mesons and baryons in terms of the quark-antiquark ($q\bar{q}$) and quark-diquark (qD) degrees of freedom, respectively. This formula is validated phenomenologically within an uncertainty determined by half the width of the resonances, With this error prescription we find from the non-strange PDG hadrons different radial slopes $\mu_{2q\bar{q}}^2 = 1.34(4)\text{GeV}^2$ and $\mu_{2qD}^2 = 0.75(3)\text{GeV}^2$, but similar angular slopes $\beta_{2q\bar{q}} \sim \beta_{2qD} \sim 1.15\text{GeV}^2$.

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Session Classification: Monday