



Contribution ID: 204

Type: Talk

A Feynman-Hellmann approach to the spin structure of hadrons

Friday, 27 June 2014 16:30 (20 minutes)

By introducing an external spin operator to the fermion action, the quark-line connected matrix elements relevant for quark spin fractions of hadrons are extracted from the linear response of the hadron energies using the Feynman-Hellmann (FH) theorem. At the $SU(3)$ -flavour symmetry point, we find that the connected quark spin fractions are universally in the range 55-70% for vector mesons and octet and decuplet baryons. There is an indication that the amount of spin suppression is quite sensitive to the strength of $SU(3)$ breaking. Finally, I also hope to present preliminary results applying the FH technique to calculations of quark line disconnected contributions to hadronic matrix elements.

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Session Classification: Hadron Structure