Contribution ID: **83** Type: **Oral**

Relativistic spin dynamics for vector mesons

Monday 24 April 2023 15:50 (25 minutes)

We propose a relativistic theory for spin density matrices of vector mesons based on Kadanoff-Baym equations in the closed-time-path formalism. The theory puts the calculation of spin observables such as the spin density matrix element ρ_{00} for vector mesons on a solid ground. Within the theory we formulate ρ_{00} for ϕ mesons into a factorization form in separation of momentum and space-time variables. The key observation is that there is correlation inside the ϕ meson wave function between the ϕ field that polarizes the strange quark and that polarizes the strange antiquark. This is reflected by the fact that the contributions to ρ_{00} are all in squares of fields which are nonvanishing even if the fields may strongly fluctuate in space-time. The fluctuation of strong force fields can be extracted from ρ_{00} of quarkonium vector mesons as links to fundamental properties of quantum chromodynamics.

Theory / experiment

Theory

Group or collaboration name

Primary authors: OLIVA, Lucia (Università di Catania, INFN Catania); Prof. WANG, Qun (University of Science and Technology of China); Dr SHENG, Xin-Li; Dr WANG, Xin-Nian (Lawrence Berkeley National Lab. (US)); LIANG, Zuo-tang (Shandong Uniersity)

Presenter: Prof. WANG, Qun (University of Science and Technology of China)

Session Classification: Parallel Session B

Track Classification: Intense field and vorticity