



Contribution ID: 119

Type: talk

Uncertainties and correlations in the framework of spatiotemporal quantum reference frames

Wednesday 25 September 2024 11:55 (35 minutes)

The perspective-dependence of position and momentum uncertainties and their correlations are studied in the framework of nonrelativistic spatiotemporal quantum frames of reference [M. Suleymanov, I.L. Paiva, E. Cohen, Nonrelativistic spatiotemporal quantum reference frames, *Phys. Rev. A* 109, 032205 (2024)]. One of the results [M. Suleymanov, A. Carmi, E. Cohen, Uncertainties and covariances in the framework of spatiotemporal quantum reference frames, forthcoming] is that, even in the non-interacting case, the Heisenberg uncertainty relations of a certain particle described by different observers do not coincide in general. What is invariant and constant for all observers, in the current framework, is the determinant of the frame-dependent total covariance matrix [A. Carmi, E. Cohen, Relativistic independence bounds nonlocality, *Sci. Adv.* 5, eaav8370 (2019)]. A generalized version of uncertainty relations is obtained for the relational description, affected by the correlations between all subsystems in a chosen frame.

Primary author: Dr SULEYMANOV, Michael

Presenter: Dr SULEYMANOV, Michael

Session Classification: Session V. Teleportation, entanglement and decoherence