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Quasimomentum distribution and expansion of an anyonic gas DARIO JUKIĆ, TENA DUBČEK, BRUNO KLAJN, ROBERT PEZER, HRVOJE BULJAN, University of Zagreb — We point out that the momentum distribution is not a proper observable for a system of anyons in two dimensions. In view of anyons as Wilczek's composite charged flux tubes, this is a consequence of the fact that the orthogonal components of the kinetic momentum operator do not commute at the position of a flux tube, and thus cannot be diagonalized in the same basis. As a substitute for the momentum distribution of an anyonic (spatially localized) state, we propose to use the asymptotic single-particle density after the expansion of anyons in free space from the state. This definition is identical to the standard one when the statistical parameter approaches that for bosons or fermions. Exact examples which underpin our proposal are shown. They reveal that the quasimomentum distribution can be used to identify anyonic statistics in standard time-of-flight measurements.

> Dario Jukić University of Zagreb

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