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The relation between wave vector and momentum in quantum mechanics

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Abstract: The fundamental relation of quantum mechanics, which correlates the momentum of a quantum particle to the wave vector of the matter wave, is re-interpreted. The wave vector, in the relation, is formulized as the integration of it along the angular coordinates for two and three dimensional cases. Various evaluations of the wave vector are performed for different types of waves and the results are discussed. Also the edge diffracted fields are considered according to the new interpretation.

Keywords: quantum mechanics, wave-number, diffraction.

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