

The Domain of the Quantum Matter Wave

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In quantum mechanics a particle is represented by a complex wave function. This is similar to the classical description of a distributed particle by a real valued density function. However, while classically the combined density of multiple particles can be decomposed into individual densities; the wave function of a multi-particle system can not always be decomposed into wave functions for the individual particles. Hence the classical assumption that density is a property of physical space, which is only possible because of the special topology of classical configuration space, does not work for quantum systems.

Key words: Quantum Matter Wave; Quantum Particle; Quantum Configuration Space.