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【554】 Duality between classical waves and particles

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Interference of single particles lies at the core of quantum mechanics. The most prominent demonstration of this effect is the double-slit experiment: a single experimental run indicates an experiment with single particles, however the statistics of repeated runs reassembles interference fringes. This is the source of the celebrated wave-particle duality. In this work we show that classical wave mechanics combined with the statistical detection model can completely reproduce quantum interference experiments with single particles. The recreation of quantum double-slit experiment using classical waves shows that the dual behaviour between waves and particles (at least its part described in this work) is not necessarily proof of a genuine quantum effect.

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