

Observation of a gravitational Aharonov-Bohm effect and its implications for quantum superpositions of Newtonian gravitational fields

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The gravitational interaction of a tungsten source mass with atomic wavepackets has been observed in an atom deBroglie wave interferometer, in a regime where the separation distance between the interfering wavepackets is comparable to their distance to the source mass. We will discuss this experiment in the context of Aharonov-Bohm effects. We will describe the relevance of these results to observation of quantum superpositions of Newtonian gravitational fields.