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Snapshots of a Quantum Bouncing Ball realized with the qBounce gravity spectrometer

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One class of gravity experiments within the qBounce project focuses on the realization of a Quantum Bouncing Ball, i.e. a measurement of the time evolution of a neutron bouncing above a horizontal plane.

We have measured, the spatial probability distribution of this Schrödinger wave packet for different observation times with a spatial resolution of about $1.8\mu\text{m}$.

We illustrate the role of interference weaving the quantum carpet of several quantum states. After a first quantum reflection, several snapshots show the fall of the wave packet.

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