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Quantum wave-mechanics of the simple pendulum via non-diffracting pendulum optical beams[1] ENRIQUE GALVEZ, JAKE FREEDMAN, JOEL AUCCAPUCLLA, YINGSI QIN, KRISTINA WITTLER, Colgate University — We simulate quantum-mechanical probabilities for the simple pendulum using non-diffracting optical beams bearing Mathieu spatial modes. These are solutions to the Helmholtz equation in elliptical coordinates, whose angular form is identical to the Schrodinger equation for the simple pendulum. As a consequence the intensity of the modes in the Fourier plane are a direct mapping of the quantum mechanical probability. We investigate stationary states and wavepackets dynamics of the pendulum via modal superpopositions.

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