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Exploring the Dynamics of a Quantum-Mechanical Compton Generator[1] MARTIN KANDES, Univ of California - San Diego, RICARDO CARRETERO, San Diego State University — In 1913, when American physicist Arthur Compton was an undergraduate, he invented a simple way to measure the rotation rate of the Earth with a tabletop-sized experiment. The experiment consisted of a large diameter circular ring of thin glass tubing filled with water and oil droplets. After placing the ring in a plane perpendicular to the surface of the Earth and allowing the fluid mixture of oil and water to come to rest, he then abruptly rotated the ring, flipping it 180 degrees about an axis passing through its own plane. The result of the experiment was that the water acquired a measurable drift velocity due to the Coriolis effect arising from the daily rotation of the Earth about its own axis. Compton measured this induced drift velocity by observing the motion of the oil droplets in the water with a microscope. This device, which is now named after him, is known as a Compton generator. The fundamental research objective of this project is to explore the dynamics of a quantum-mechanical analogue to the classical Compton generator experiment through the use of numerical simulations. We present our preliminary results on this system and the future direction of the project.

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