Contribution ID: **187** Type: **Poster**

Quantum Simulation of Oscillatory Unruh Effect with Superposed Trajectories

Tuesday, 26 September 2023 19:30 (2 hours)

A detector moving with relativistic accelerated trajectory would experience Unruh effect and raise both detector excitation and particle creation in the accelerated frame, despite being in a vacuum in the rest frame. We simulate such an effect in the case of the detector oscillating in a cavity with a laser-controlled trapped ion. The simulation could be extended to superposed quantum trajectories, leading to coherent interference of excitation. Our demonstration reveals the Unruh's prediction regarding particle creation by non-inertial motion, as well as the novel coherent effects in quantum field theory relating to quantum gravity.

Primary authors: Mr CHENG, Xu (University of Science and Technology of China); Mr LI, Yue (University of Science and Technology of China); Mr TIAN, Zehua (University of Science and Technology of China); Mr ZHAO, Xingyu (University of Science and Technology of China); Ms HOU, Waner (University of Science and Technology of China); Mr ZHU, Mingdong (University of Science and Technology of China); Mr YAN, Lin (University of Science and Technology of China); Dr KAMRAN, Rehan; Prof. QIN, Xi (University of Science and Technology of China); Prof. LIN, Yiheng (University of Science and Technology of China); Prof. DU, Jiangfeng (University of Science and Technology of China)

Presenters: Mr CHENG, Xu (University of Science and Technology of China); Prof. LIN, Yiheng (University of Science and Technology of China)

Session Classification: Tuesday Poster