Abstract Submitted
for the 4CF14 Meeting of
The American Physical Society

Search for Laser Second Harmonic Generation in Helium CHRIS OLSEN, DAVID SQUIRES, MICHAEL WARE, JUSTIN PEATROSS, None — Strong-field laser-atom interactions provide extreme conditions that may be useful for investigating the de Broglie-Bohm interpretation of quantum mechanics. Bohmian trajectories representing bound electrons in individual atoms exhibit both even and odd harmonic motion when subjected to a strong applied laser field. If even harmonics from symmetric atomic potentials such as helium are observed, it would suggest that the de Broglie/Bohm interpretation possesses a certain predictive power within the semiclassical framework, which aims for consistency with QED. The ramifications might impact how we view quantum wave functions and associated notions such as "wave-function collapse." Even-order harmonics computed using Bohmian mechanics carry random phase, dependent on initial positions of trajectories within the wave function. Under the conjecture that a Bohmian point particle plays the role of light emitter, the random phase would explain why even harmonics generated in monatomic gasses have not been observed to date, since the emission would be incoherent. We report on a search for the possibility of faint even-harmonic incoherent emission from helium.

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None

Date submitted: 12 Sep 2014 Electronic form version 1.4