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Energy level shift of quantum systems via the electric Aharonov-Bohm effect

A novel version of the electric Aharonov-Bohm effect is proposed where the quantum system which picks up the Aharonov-Bohm phase is confined to a Faraday cage with a time-varying, spatially uniform scalar potential. The electric and magnetic fields in this region are effectively zero for the entire period of the experiment. The observable consequence of this version of the electric Aharonov-Bohmn effect is to shift the energy levels of the quantum system rather than shift the fringes of the 2-slit interference pattern. We show a strong mathematical connection between this version of the scalar electric AB effect and the AC Stark effect.

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