Contribution ID: **67**   Type: **oral presentation**

The covariant, time-dependent Aharonov–Bohm effect

Thursday, 15 August 2013 17:20 (20 minutes)

We discuss two possible covariant generalizations of the Aharonov–Bohm effect – one expression in terms of the space–time line integral of the four-vector potential and the other expression in terms of the space–time "area" integral of the electric and magnetic fields written in terms of the Faraday2-form. These expressions allow one to calculate the Aharonov–Bohm effect for time-dependent situations.In particular, we use these expressions to study the case of an infinite solenoid with a time varying flux and find that the phase shift is zero due to a cancellation of the Aharonov–Bohm phase shift with a phase shift coming from the Lorentz force associated with the electric field, $E = -dA/dt$, outside the solenoid.This result may already have been confirmed experimentally.

APS member ID

60018910

Primary author: Prof. SINGLETON, Douglas (California State University, Fresno)

Co-author: Dr VAGENAS, Elias (Research Center for Astronomy and Applied Mathematics, Academy of Athens)

Presenter: Prof. SINGLETON, Douglas (California State University, Fresno)

Session Classification: Field and String Theory

Track Classification: Field and String Theory