

## Geometric Phase for Neutral Particle in the Presence of a Topological Defect

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In this contribution we study the quantum dynamics of a neutral particle in the presence of a topological defect. We investigate the appearance of a geometric phase in the relativistic quantum dynamics of neutral particle which possesses permanent magnetic and electric dipole moments in the presence of an electromagnetic fields in this curved background. The nonrelativistic quantum dynamics are investigated using the Foldy-Wouthuysen expansion. The gravitational Aharonov-Casher and He-Mckellar-Wilkens effects are investigated for a series of electric and magnetic fields configurations. We have studied the influence of the topological defect in the geometric phases of dipoles in relativistic dynamics. We found a new contribution to geometric phase due the presence of topological defect. This contribution is a nondispersive topological contribution to total geometrical phase acquired by the neutral particle. This contribution is of gravitational origin due curvature introduced by defect in the space-time.