



Contribution ID: 11

Type: not specified

General Treatment of the Monopole Production Cross Sections by Drell-Yan and Photon Fusion for Three Spin Models

Wednesday 10 January 2018 14:50 (20 minutes)

Recently there is a revived interest in monopole searches with masses accessible at current colliders, due to several theoretical models predicting the existence of light monopoles. However all of such models predict monopoles with structure (solitons), whose production at colliders may be strongly suppressed. On the other hand, there is no theory up to now for point-like monopoles, viewed as sources of singular magnetic fields, of the type envisaged by Dirac. For the latter type, there are only effective descriptions, viewing the monopole as a matter field, which may carry spins 0, $\frac{1}{2}$ or 1 and all three cases are actively searched for in the MoEDAL detector at CERN. Theoretical expressions for kinematic distributions serve as guides to these searches. The cross section distributions in each case are presented, derived from a U(1) invariant gauge theory. The analytical expressions in the spin $\frac{1}{2}$ and 1 cases are defined completely generally through the inclusion of a magnetic moment term proportional to a parameter κ , related to the gyromagnetic ratio $g_R = 1 + \kappa$. This term does not exist in the spin 0 case. This original work proposes κ as a new phenomenological parameter in monopole searches.

What would be the preferred length of your talk?

20 minutes + questions

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Session Classification: Session I