

Searching for Magnetic Monopoles and other Exotics with MoEDAL

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MoEDAL is an experiment at the LHC that is dedicated to searches for magnetic monopoles (MM) and other exotic particles. In Run 2, MoEDAL established best current laboratory constraints for point-like MM with magnetic charges ranging from 2 to 5 Dirac charges, surpassing the results of ATLAS in this range. MoEDAL also performed the first search for Dyons, particles with both electric and magnetic charge. More recently, MoEDAL performed a pioneering search for MM production in Pb-Pb collisions via the Schwinger mechanism, establishing first reliable mass limits on composite MMs in a collider experiment. Apart from particles with magnetic charge, MoEDAL is sensitive to highly electrically charged objects (which may include aggregates of quark matter, Q-balls, or micro black hole remnants) and long-lived particles (having a particularly competitive sensitivity to doubly charged fermions). A recently approved addition of a new sub-detector – MoEDAL Apparatus for Penetrating Particles, or MAPP – will also allow MoEDAL to have competitive sensitivity to milli-charged particles, which are predicted within the framework of vector portal dark sector models. This talk will introduce the MoEDAL experiment, describe its recent results, and present plans for the LHC Run 3 and beyond.

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