

Bounds and Prospects for Stable Multiply Charged Particles at the LHC

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Colored and colorless particles that are stable on collider scales and carry exotic electric charges, so-called MCHSPs, exist in extensions of the Standard Model, and can include the top partner(s) in solutions of the hierarchy problem. In this talk I will present a recast of two production channels of MCHSPs: the “open” channel – where the particles are pair-produced above threshold, and are detectable in dedicated LHC searches for stable multiply charged leptons, and the “closed” channel – where a particle-antiparticle pair is produced as a bound state, detectable in searches for a diphoton resonance. We obtain current and projected bounds on the masses of MCHSPs with different quantum numbers. In all cases there is a crossover between dominance by open and closed searches at some charge. Moreover, we show that a joint observation in the open and the closed channels allows to determine the mass, spin, color, and electric charge of the particle.

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