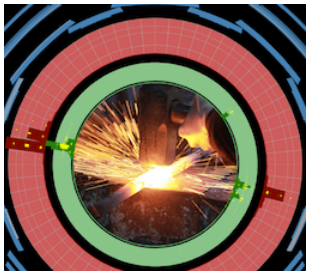

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Cosmic ray air showers from sphalerons

Monday 9 May 2016 15:30 (15 minutes)

The discovery of the Higgs boson marks a key ingredient to establish the electroweak structure of the Standard Model. Its non-abelian gauge structure gives rise to, yet unobserved, non-perturbative baryon and lepton number violating processes. We propose to use cosmic ray air showers, as mea- sured, for example, at the Pierre Auger Observatory, to set a limit on the hadronic production cross section of sphalerons. We identify several observables to discriminate between sphaleron and QCD induced air showers.

Summary

The discovery of the Higgs boson marks a key ingredient to establish the electroweak structure of the Standard Model. Its non-abelian gauge structure gives rise to, yet unobserved, non-perturbative baryon and lepton number violating processes. We propose to use cosmic ray air showers, as mea- sured, for example, at the Pierre Auger Observatory, to set a limit on the hadronic production cross section of sphalerons. We identify several observables to discriminate between sphaleron and QCD induced air showers.

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