

XXX-th International Workshop on High Energy Physics “Particle and
Astroparticle Physics, Gravitation and Cosmology: Predictions, Observations
and New Projects”



Contribution ID: 6

Type: **Presentation**

Electroweak Processes in Laser-Boosted Lepton Collisions

Monday 23 June 2014 17:25 (25 minutes)

The associated creation of a Higgs and a Z^0 boson in relativistic lepton-antilepton collisions taking place in a strong laser field is studied. The energy of the pre-accelerated particles may be vastly increased by their interaction with the intense laser field. The total cross section as well as the produced Higgs boson's energy distribution are calculated and related to field-free collisions of corresponding center-of-mass energy. Possible qualitative differences with regard to the detection of the Higgs bosons are presented. The required laser parameters and other experimental challenges are specified [1].

[1] S. J. Müller, C. H. Keitel, and C. Müller, Phys. Lett. B 730, 161 (2014).

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Session Classification: Physical possibilities of future colliders and other facilities