A first discussion of 13 TeV results
April 10-15, 2016, Obergurgl University Center, Tirol, Austria

Contribution ID: **54** Type: **Talk**

Convexity, gauge-dependence, and tunneling rates

The experimental data point towards the fact that the Standard Model, when assumed to be valid up to very high energies, might be metastable. The stability properties of the theory strongly depend on the Higgs and top masses, so that it becomes important to perform precise, unambiguous computations. Traditionally, these rely on calculating the effective potential and checking for an instability. Once this is known, the lifetime of the Higgs vacuum can be estimated from semiclassical computations of tunneling rates. This approach suffers from two conceptual problems. First, the true effective potential of the theory is known to be concave and real, and thus cannot have false vacua. Second, it is also gauge-dependent, which opens up the question of how to get unambiguous results for decay rates. We will show how these issues can be overcome.

Primary author: TAMARIT, Carlos (IPPP Durham)

Co-author: Mr PASCENCIA-CONTRERAS, Alexis (Durham IPPP)

Presenter: TAMARIT, Carlos (IPPP Durham)

Track Classification: Scalar Sector