



Contribution ID: 59

Type: Oral

”Here be SUSY” - Prospects for SUSY searches at future colliders

Some say SUSY is dead, because LHC has not discovered it yet. But is this really true? It turns out that the story is more subtle. SUSY can be ‘just around the corner’, even if no signs of it has been found and a closer look is needed to quantify the impact of LHC limits and their implications for future colliders. In this contribution, a study of prospects for SUSY based on scanning the relevant parameter space of (weak-scale) SUSY parameters, is presented.

I concentrate on the properties most relevant to evaluate the experimental prospects: mass differences, lifetimes and decay-modes. The observations are then confronted with estimated experimental capabilities, including - importantly - the detail of simulation these estimates are based upon.

I have mainly considered what can be expected from LHC and HL-LHC, where it turns that large swaths of SUSY parameter space will be quite hard to access. For $e+e-$ colliders, on the other hand, the situation is simple: at such colliders, SUSY will be either discovered or excluded almost to the kinematic limit.

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Session Classification: Physics and Detectors: Track 1

Track Classification: Physics and Detectors: Track 1: Physics at $e+e-$ colliders