Theory challenges for LHC physics



Contribution ID: 59 Type: not specified

S-matrix approach to the Z line shape

Wednesday, 29 July 2015 15:00 (30 minutes)

The Z boson line shape can be studied with unprecedented precision at certain future e+e- collider projects. For example, the Fcc-ee might produce 10^13 Z bosons. This will demand for true two-loop calculations in the Standard Model, and even higher precision in the QED part. As alternative, sophisticated model-independent approaches are welcome. I discuss questions related to both theoretical scenarios, with an emphasis of the role of the S-matrix approach to data, as it is realized in the SMATASY/ZFITTER project. Existing experimental studies are reviewed.

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Session Classification: CALC2015 Workshop