Contribution ID: **39** Type: **Oral presentation using Zoom**

Impact of overlay events on the charged IDM scalar reconstruction at CLIC

Wednesday, 27 October 2021 19:20 (20 minutes)

The Inert Doublet Model (IDM) is one of the simplest SM extensions and introduces four new scalar particles: $H^{\pm}$, A and H; the lightest, H, is stable and hence it is a natural dark matter (DM) candidate. A set of benchmark points is considered, which are consistent with current theoretical and experimental constraints and promise detectable signals at future colliders. Discovery reach for the IDM charged scalar pair-production is considered for the semi-leptonic final state at the two high-energy CLIC stages. Five selected benchmarks were analysed with full detector simulation and the study was extended to more scenarios using Delphes fast simulation.

In the several benchmark scenarios, the small mass splitting between scalars $H^{\pm}$ and A makes the final state reconstruction vulnerable to beam-induced $\gamma\gamma \to$ hadrons overlay events. It is, however, not possible to apply the same background mitigation procedure in Delphes as implemented in the full CLIC detector simulation and reconstruction algorithms. Therefore, an approximate method of taking it into account has been developed and the results obtained this way show good agreement with the full simulation.

1st preferred time slot for your oral presentation

19:00-21:00 JST (12:00-14:00 CEST, 6:00-8:00 EDT, 3:00-5:00 PDT)

2nd preferred time slot for your oral presentation

15:30-17:30 JST (8:30-10:30 CEST, 2:30-4:30 EDT, 23:30-1:30 PDT)

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