Contribution ID: **52** Type: **Poster**

Sensitivity of future e+e- colliders to processes of dark matter production with light mediator exchange

Monday, January 10, 2022 4:36 PM (1 minute)

High energy □+□– colliders offer unique possibility for the most general search for dark matter (DM) based on the mono-photon signature. As any □+□– collision processmay include hard initial-state photon radiation, analysis of the energy spectrum and angular distributions of observed photons can be used to search for hard processes with an invisible final state.
We consider production of DM particles at the International Linear Collider (ILC) and Compact Linear Collider (CLIC) experiments via a mediator exchange. Dedicated procedure of merging the matrix element calculations with the lepton ISR structure function was developed to model the Standard Model background processes contributing to mono-photon signature with WHIZARD.
Detector effects are taken into account within the DELPHES fast simulation framework. Limits on the light DM production cross section in a simplified model are set as a function of the mediator mass and width based on the expected two-dimensional distributions of the reconstructed mono-photon events.
Limits on the mediator couplings are then presented for a wide range of mediator masses and widths. For light mediators, for masses up to the centre-of-mass energy of the collider, coupling limits derived from the mono-photon analysis are more stringent than those expected from direct resonance searches in decay channels to SM particles.

Primary author: KALINOWSKI, Jan Henryk (University of Warsaw)

Co-authors: ZARNECKI, Aleksander Filip (University of Warsaw); MEKALA, Krzysztof (University of Warsaw); KOTLARSKI, Wojciech (TU - Dresden); SOPICKI, Pawel (University of Warsaw (PL))

Presenter: KALINOWSKI, Jan Henryk (University of Warsaw)

Session Classification: Future experiments and facilities

Track Classification: Future experiments and facilities