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Dark Photon Searches at Future e^+e^- Colliders — •Sepideh Hosseini[1,2], Jenny List[2], Mikael Berggren[2], and Gudrid Moortgat-Pick[1,2] — [1]University of Hamburg — [2]DESY Hamburg

The dark photon (A_D) is a hypothetical particle that can be possibly produced through its kinetic mixing with the ordinary, visible photon. The existence of kinetic mixing means that the two gauge bosons can transform into each other as they propagate and this provides a link between the dark and visible sectors. The decay modes of the dark photon to the standard model charged fermions motivate to look at $A_D \to \mu^+\mu^-$ as signal. The dark photon will have a specific mass and hence, the invariant mass of the muon pair is the main observable to look for the dark photon in the presence of standard model background. For this, we evaluate the prospects to detect the dark photon and to determine the mixing parameter for the example of the International Large Detector (ILD) concept at the International Linear Collider (ILC).

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