

## Physics at HERA+LC based $\gamma p$ Colliders

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### Abstract

In this proceeding I discuss the proposal of constructing a  $\gamma p$  collider at DESY based on a Linac-Ring type  $ep$  machine, the HERA+LC. A high energy  $\gamma$  beam for this collider is produced by the Compton back-scattering of laser photons off the electron beam from the linear accelerator. Using the parameters of the proton ring of HERA and those of the proposed linear  $e^+e^-$  colliders (LC, specifically TESLA, CLIC or Linac1) we expect a luminosity of  $L_{\gamma p} = (1 - 2) \times 10^{31} \text{ cm}^{-2} \text{ s}^{-1}$ , due to a reasonable improvement of the proton beam. We examine the physics research program for the HERA+LC  $\gamma p$  collider proposal. The search for supersymmetric particles, leptoquark production and heavy quark investigations are considered in detail. The polarization asymmetries for the production of SUSY partners are also studied. The capacity of HERA+LC surpasses that of HERA and is comparable with the LC. Polarization facilities of the gamma and proton beams and the clearer background compared to the hadron colliders are stated as additional advantages of the proposed  $\gamma p$  collider.

### References

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