

## Contribution submission to the conference Heidelberg 2022

**Reconstruction of the displaced  $\tau$  for the long-lived  $\tau$  slepton searches at CMS** — ●MYKYTA SHCHEDROLOSIEV<sup>1</sup>, KONSTANTIN ANDROSOV<sup>2,3</sup>, ANDREA CARDINI<sup>1</sup>, DIRK KRÜCKER<sup>1</sup>, and ISABELL MELZER-PELLMANN<sup>1</sup> — <sup>1</sup>DESY, Hamburg, Germany — <sup>2</sup>École polytechnique fédérale de Lausanne — <sup>3</sup>ETH Zurich

Supersymmetric scenarios with long-lived tau sleptons are well motivated, e.g. within gauge mediated symmetry breaking scenarios. Direct searches of  $\tilde{\tau} \rightarrow \tau \tilde{\chi}_0^1$  are limited by the reconstruction efficiency of displaced tau leptons at CMS that are produced up to 50 cm away from the IP. In our study, we explore the optimization of the displaced  $\tau$  lepton reconstruction using deep neural networks for the corresponding stau searches.

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