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Dark Matter constraints from LEP data

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We analyze LEP monophoton data to set limits on the Dark Matter (DM) production cross section in the process $e^+e^- \rightarrow \chi \chi \gamma$, where χ is the DM particle. We then translate these limits into constraints on the DM-nucleon and DM-electron scattering cross sections and on the DM annihilation cross sections. In doing so, we consider different types of DM interactions (scalar, vector, and axial vector interactions), we distinguish between interactions mediated by light and heavy intermediate particle, and we consider both leptophilic and nucleophilic scenarios. In many of these scenarios our limits on the DM scattering cross sections are superior to those from direct detection experiments if DM is light (< 10 - 100 GeV). Our constraints on the DM annihilation cross section are highly competitive as well, for example we are able to rule out a light (< 10 GeV) thermal relic in many cases.

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Classification de Session: Astroparticles - Dark Matter

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