Contribution ID: **9** Type: **20 minutes talk**

Probing low-reheating scenarios with minimal freeze-in dark matter

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The parameter space of freeze-in dark matter through light dark photon ("minimal freeze-in dark matter") is currently being probed by direct detection experiments through electron and nuclear recoil. We show the dark matter production in this scenario is sensitive to cosmic equation of state during reheating, from matter-like to kination-like. The main result is that low reheating scenario with reheating temperature
Trh
$lesssim$1˜TeV is severely constrained by current experiments and can be completely probed up to
Trh
$lesssim$10˜TeV in future experiments, leaving only two viable dark matter mass ranges 0.03 MeV
$lesssimm_{\chi}$
$lesssim$1˜MeV and m_{χ}
$gtrsim$10˜TeV.

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