# Sensitivity of the redshifted 21 cm signal from Dark Ages to parameters of primordial magnetic fields

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The 21 cm line of neutral hydrogen serves as a powerful probe of the early Universe, offering insights into the post-recombination epoch known as the "Dark Ages". Understanding the influence of primordial magnetic fields **(**PMFs**)** on this signal is crucial, as they can alter the thermal evolution of the intergalactic medium through energy dissipation. This study establishes the sensitivity of the global 21 cm signal to the large-scale averaged amplitude and power spectrum index of PMFs. We analyze the impact of decaying magnetic turbulence and ambipolar diffusion on the ionization and thermal history of the Dark Ages Universe ($30 \leq z \leq 300$), and their imprint on the spectral profile of the global 21 cm signal. The heating function caused by decaying magnetic turbulence monotonically decreases after cosmological recombination; its amplitude strongly depends on the strength of the PMFs amplitude $B_0$ and weakly depends on the spectral index $n_B$. The heating function caused by ambipolar diffusion, in contrary, noticeably depends on spectral index in the range $-3 \lesssim n_B \lesssim -1$, but is subdominant in the Dark Ages epoch for PMF models with $B_0 \lesssim 0.5$ nG. We computed the ionization and thermal history of intergalactic gas from the cosmological recombination to the end of the Dark Ages for a range of PMF parameters $0.05 < B_0 < 0.5$ nG, $-2.9 < n_B < 4$ , and show essentially distinguished thermal evolution from one in the ΛCDM model. We also show that the profile of the redshifted 21 cm hydrogen line is very sensitive to the PMF parameters from this range and can be used for their constraints in conjunction with other observational data.