

Retrieving the ionospheric currents and magnetic field variations from the observation of the upper atmosphere emissions polarisation

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Since the last solar solar maximum, a team of french and belgian scientists have taken upon themselves to hunt down traces of polarisation in the upper atmosphere emissions. After having discovered it in four visible auroral lines (Lilensten et al. 2016, Bosse et al. 2020) the question of its origin still remained. Did we detect a polarisation linked to the emission processes? Or to scattering in the lower atmosphere?

Thanks to the support of PITHIA, we could perform a first coordinated observation with EISCAT and our optical polarimeter that confirmed the ionospheric origin (Bosse et al. 2022a,b) and that the polarisation is linked to the auroral emission processes. This and the following modeling allowed to show that the nightglow and auroral polarisation is a new window on our space environment, that may allow to track the ionospheric currents.