Optical conditions during the RENU 2 launch

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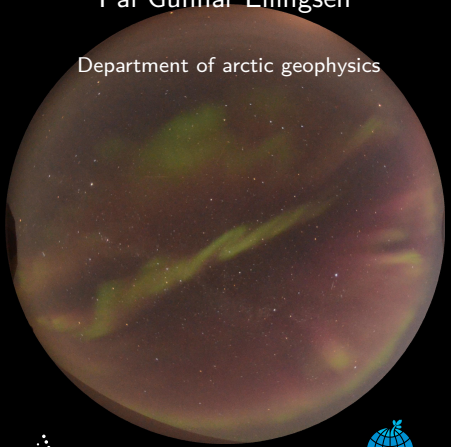

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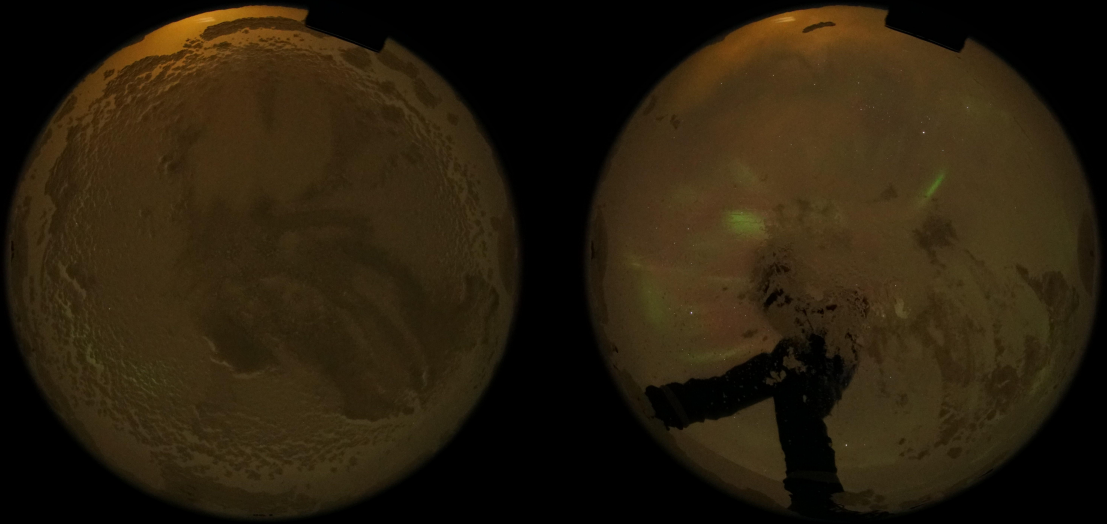
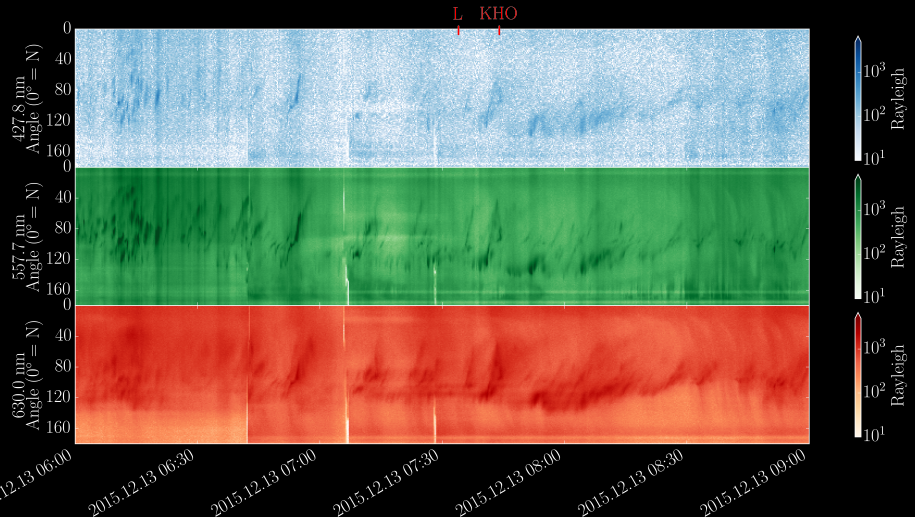
The day of the launch

The day was a good day, with respect to the ionosphere conditions, though the ground conditions in Longyearbyen were challenging. We had a partial cloud cover, and snow showers.


06:02 UT
06:08 UT

MSP 06:00 UT - 09:00 UT



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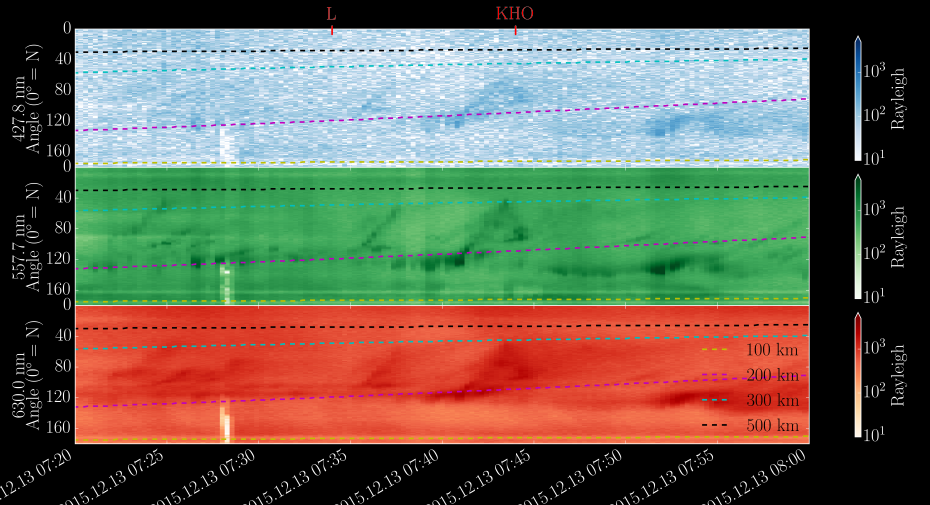
MSP launch



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Sunlit aurora

The solar EUV photoionises N_2 via

$$N_2 + h\nu(< 79.6\,\text{nm}) \longrightarrow {N_2}^+ + e^-$$

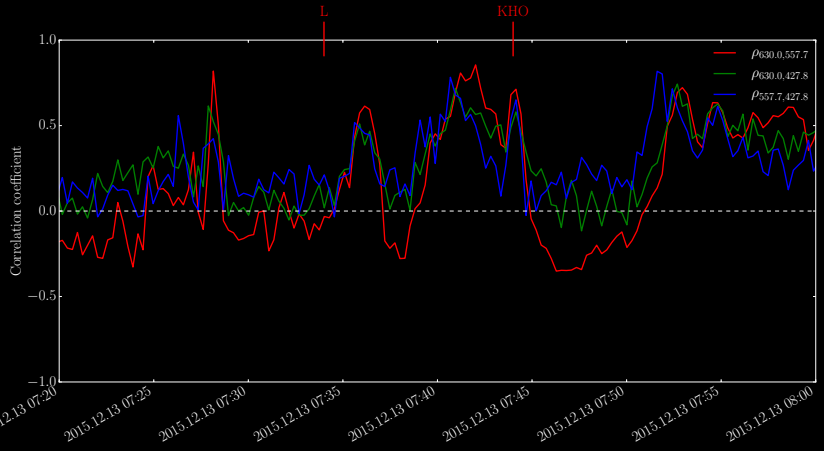
which has a well known decay ($B^2\,{\Sigma_u}^+ - X^2\,{\Sigma_g}^+$) at 427.8 nm known as the ${N_2}^+$ 1N, or first negative decay, that can be excited by particle precipitation (electrons).
Non sunlit main process is

$$N_2 + {e^-}^\bullet \longrightarrow {N_2}^+ + {e^-}^\bullet + e^-$$

How does the N_2 get there?

O.-P. Jokiaho, "Spectral modelling of molecular nitrogen in aurora," Doctoral Thesis. University of Southampton (2009)
D. M. Hunten, "Sunlit aurora and the N2 + ion: A personal perspective," Planet. Space Sci. 51(13), 887–890 (2003).

Sunlit aurora detection in the MSP



Where the correlation coefficient is given by $\rho(t) = \frac{\mathrm{Cov}(C_A(t), C_B(t))}{\sigma_A(t)\sigma_B(t)}$

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