

Earth's aurora response to solar wind conditions

- Sketch of a project on the aurora for high school pupils; can be adapted according to the time available and background knowledge of the students
- Tutoring by PhD student one afternoon every two weeks over ~3 months; pupils present their results to teachers audience at the end
- Michaela Mooney & Graziella, MSSL

Sketch of a school project



Introduction

Describe to students about solar wind and Earth's magnetosphere, Dungey cycle, aurora formation at different wavelengths, SMILE, ...

Consider Earth's magnetopause standoff distance (position of subsolar point): When at < 6.6 RE (geosynchronous orbit radius) this indicates magnetosphere is strongly compressed by extreme solar wind conditions

What are the consequences on the aurora (UV and X-ray)?

Plan

Gather OMNI Solar Wind and IMF data (Jan. 1995 – Dec. 2018) Compute magnetopause standoff distance with LIN model Select cases with magnetopause standoff distance < 6.6 RE Also select some cases with magnetopause standoff distance ~ 8, 9, 10, 11 RE as comparisons

Gather auroral images for selected cases above, from IMAGE (UV, 2000 – 2005) and Polar (X-ray, PIXIE, from 1996-03-19 to 2002-11-09)

Calculate aurora parameters (location, extent, brightness) and compare compressed and 'normal' conditions, deriving some conclusions on relations solar wind - aurora