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Solar-Terrestrial Coupling Processes driving Sporadic E Layer formation in our Atmosphere

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The GNSS radio occultation (RO) technique has been established successfully during the previous two decades. It evolved into a valuable observation tool for precise atmospheric and ionospheric vertical profiling. Until today, there are about 18 million RO recordings available.

GNSS RO signals are very sensitive to vertical electron density gradients in the Earth's ionosphere. They become visible as strong fluctuations in, e.g., signal-to-noise ratio recordings, which allow detecting ionospheric disturbances like sporadic E (Es) layers in the lower ionospheric E region.

According to theory, Es layers result from complex coupling processes between metallic ions of meteoric origin that are compressed into compact layers by vertical shears of the zonal wind and geomagnetic Lorentz forcing. In this poster, we will discuss the solar-terrestrial coupling processes that drive and prevent the sporadic E layer occurrence in our atmosphere.

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