

Numerical modelling of Nu whistlers observed by the MAGION 5 satellite

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The properties of Nu whistlers are discussed in the light of observations by the MAGION 5 satellite, and of numerically simulated spectrograms of lightning-induced VLF emissions. The method of simulation is described in full. With the information from this numerical modelling, we distinguish the characteristics of the spectrograms that depend on the site of the lightning stroke from those that are determined mainly by the position of the satellite. Also we identify the region in the magnetosphere where Nu whistlers are observed most often, and the geomagnetic conditions favouring their appearance. The relation between magnetospherically reflected (MR) whistlers and Nu whistlers is demonstrated by the gradual transformation of MR whistlers into Nu whistlers as the satellite moves from the high-altitude equatorial region to lower altitudes and higher latitudes. The magnetospheric reflection of nonducted whistler-mode waves, which is of decisive importance in the formation of Nu whistlers, is discussed in detail.