



A survey of polar cap densities based on EFW probe measurements

Knut Svenes (1), Stein Haaland (2,3), Bjørn Lybekk (4), and Arne Pedersen (4)

(1) Norwegian Defence Research Establishment, Norway (knut.svenes@ffi.no), (2) University of Bergen, Norway, (3) Max-Planck Institute, Lindau, Germany (Stein.Haaland@issi.unibe.ch), (4) University of Oslo, Norway (bjorn.lybekk@fys.uio.no)

The polar cap and magnetospheric lobe regions are interfaces between plasma sources in the solar wind and ionosphere. Due to the low plasma density and high potential obtained by spacecraft in these regions, in-situ measurements based on traditional particle instruments are notoriously difficult. We have obtained new and more accurate plasma densities in these regions based on spacecraft potential measurements from the EFW-instrument. Plasma density values are found from such observations by converting from the potential measurements using a functional relationship between these two parameters.

From a database containing 10 years of data, the density distribution can be obtained for the lobe and polar cap regions and to some extent their footpoint in the polar ionosphere. Based on this material, statistical investigations of variations in the density and polar cap size are carried out with respect to solar wind driving as well as internal magnetospheric processes. Similarities and variations in solar cycle dependency are discussed.