

COMPARATIVE ANALYSIS OF CASSINI'S TITAN FLYBYS T25-T33 ACCORDING TO THE MEASUREMENTS OF CASSINI-MIMI AND CAPS

ZSOFIA BEBESI 1, Norbert Krupp 1, Stamatios Krimigis 2, Markus Fränz 1, Donald G. Mitchell 2, Karoly Szegö 3, David T. Young 4, Michele K. Dougherty 5

1 Max-Planck Institute for Solar System Research, Katlenburg-Lindau, Germany,
e-mail: bebesi@mps.mpg.de

2 Applied Physics Laboratory, Johns Hopkins University, Laurel, MD 20723, USA

3 KFKI Research Institute for Particle and Nuclear Physics, Budapest, Hungary

4 Southwest Research Institute, San Antonio, TX, USA

5 Imperial College, Blackett Laboratory, London, UK

In this study we focused on 9 targeted Titan flybys of Cassini between DOY 053-180 in 2007 (T25-T33). We analyzed the measurements of the Cassini MIMI-LEMMS and CAPS-IMS instruments, and also used the data of the onboard Magnetometer. During these flybys Titan was located at approximately the same position (at ~13.5 SLT) along its orbit, the unique T32 - when the moon was found in Saturn's magnetosheath - was observed in this period as well. Since the relative positions of the dominant ionization sources (solar EUV, charge exchange, magnetospheric electron impacts) were similar during these flybys, it is reasonable to compare the measurements and get a more detailed picture of Titan's global plasma environment. The flybys were carried out during the high inclination phase of the Cassini Tour. Our analysis was focused on the differential intensities of energetic electrons and ions, and we also used the low energy ion measurements of CAPS-IMS. Another question that we investigated was concentrated on T32, during which the magnetosphere was significantly more compressed compared to the other flybys of this group. Therefore we analysed the possibility of a solar event reaching Saturn at this time. In April and May 2007 there were several active regions on the Sun, so we used plasma parameters measured by the Venus Express spacecraft (which was approximately along the Sun-Saturn line) to estimate whether the energetic particles of a CME erupted towards Saturn could have been responsible for the compression detected during T32.

Titan, Cassini, plasma

Max Planck Institute for Solar System Research, Max Planck Str. 2, 37191 Katlenburg-Lindau, Germany, tel.: +49 5556 979 217, fax: +49 5556 979 240, e-mail: bebesi@mps.mpg.de