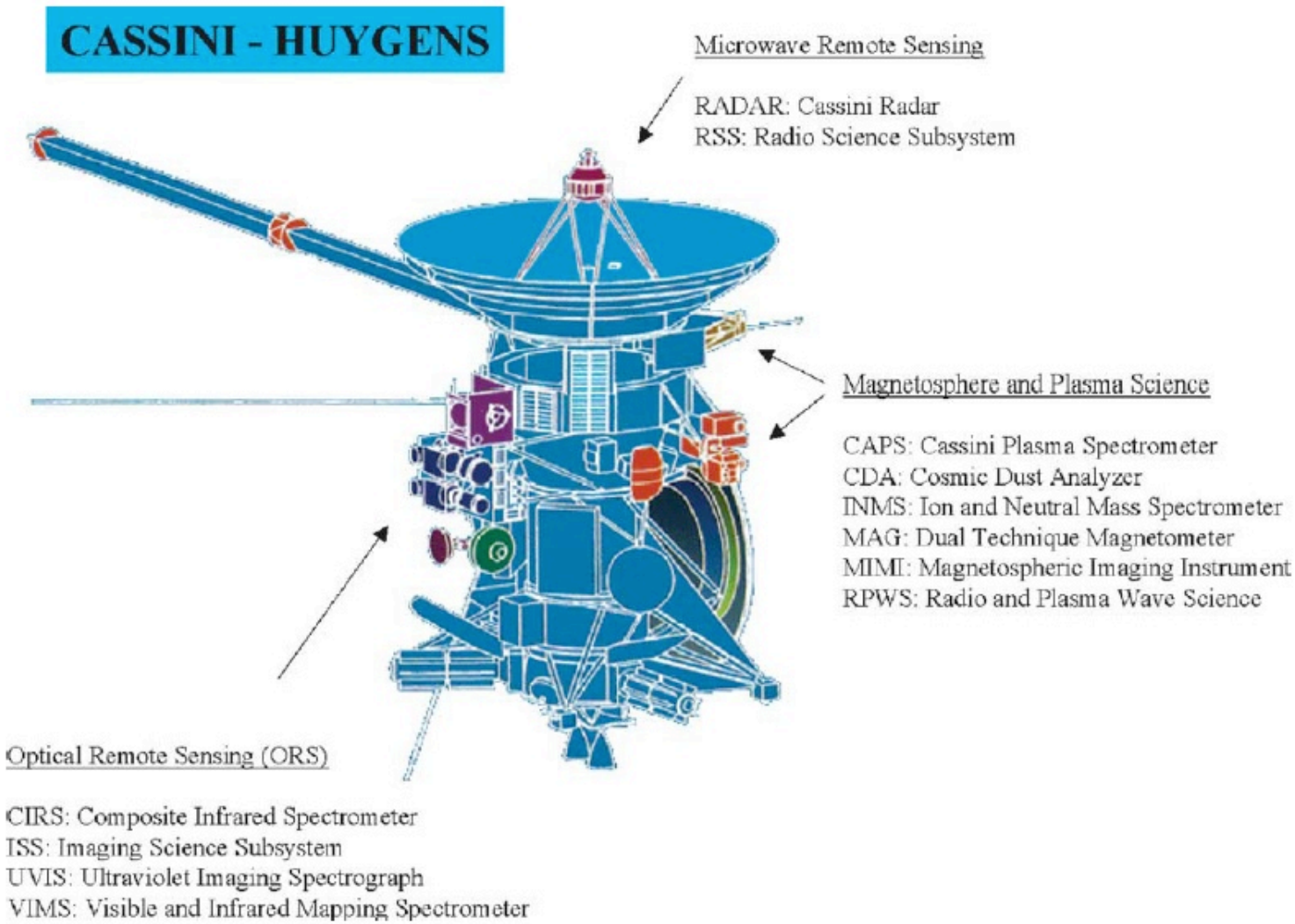
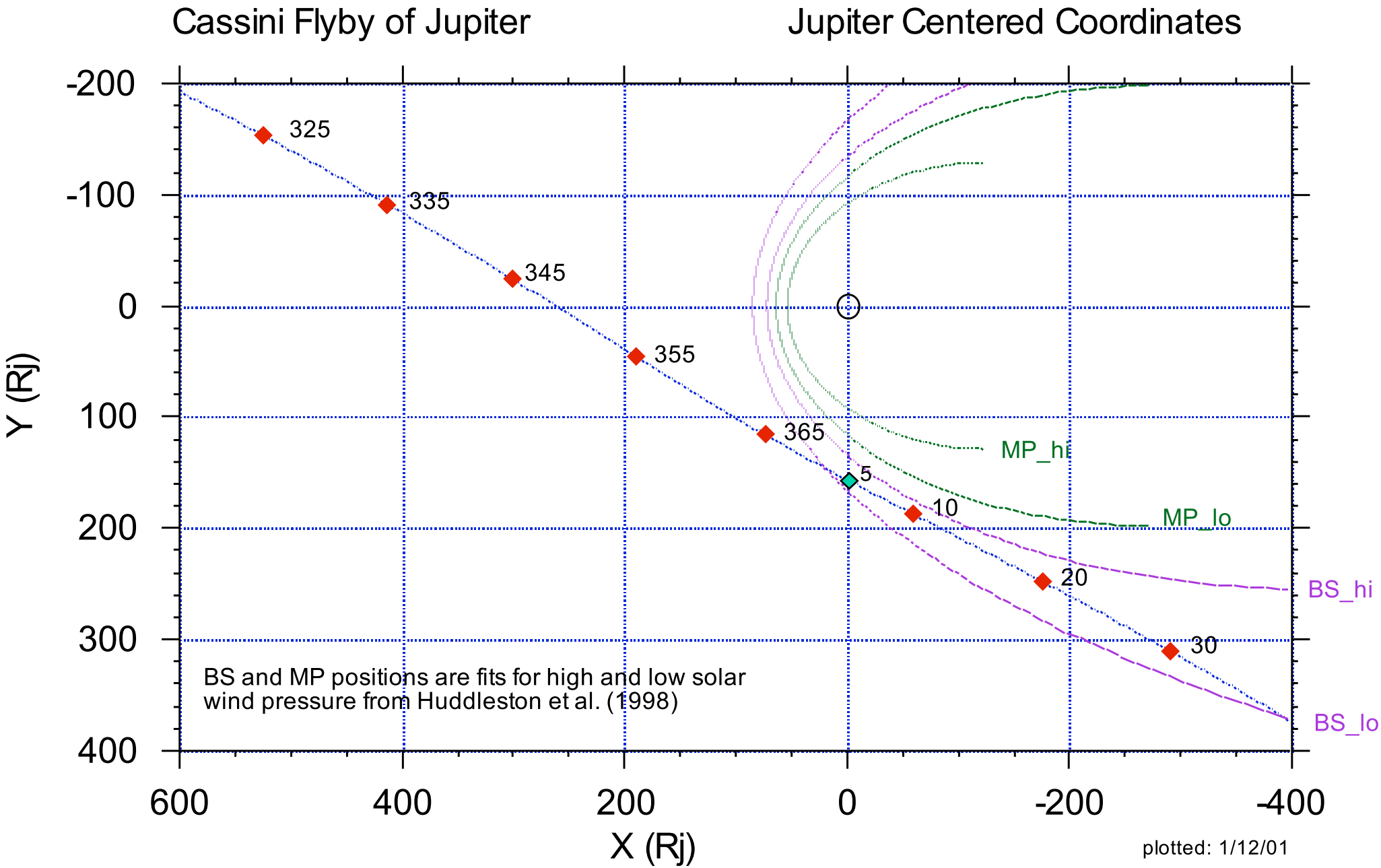
# La Magnétosphère de Jupiter : Revue des résultats de Cassini

P. Zarka, LESIA

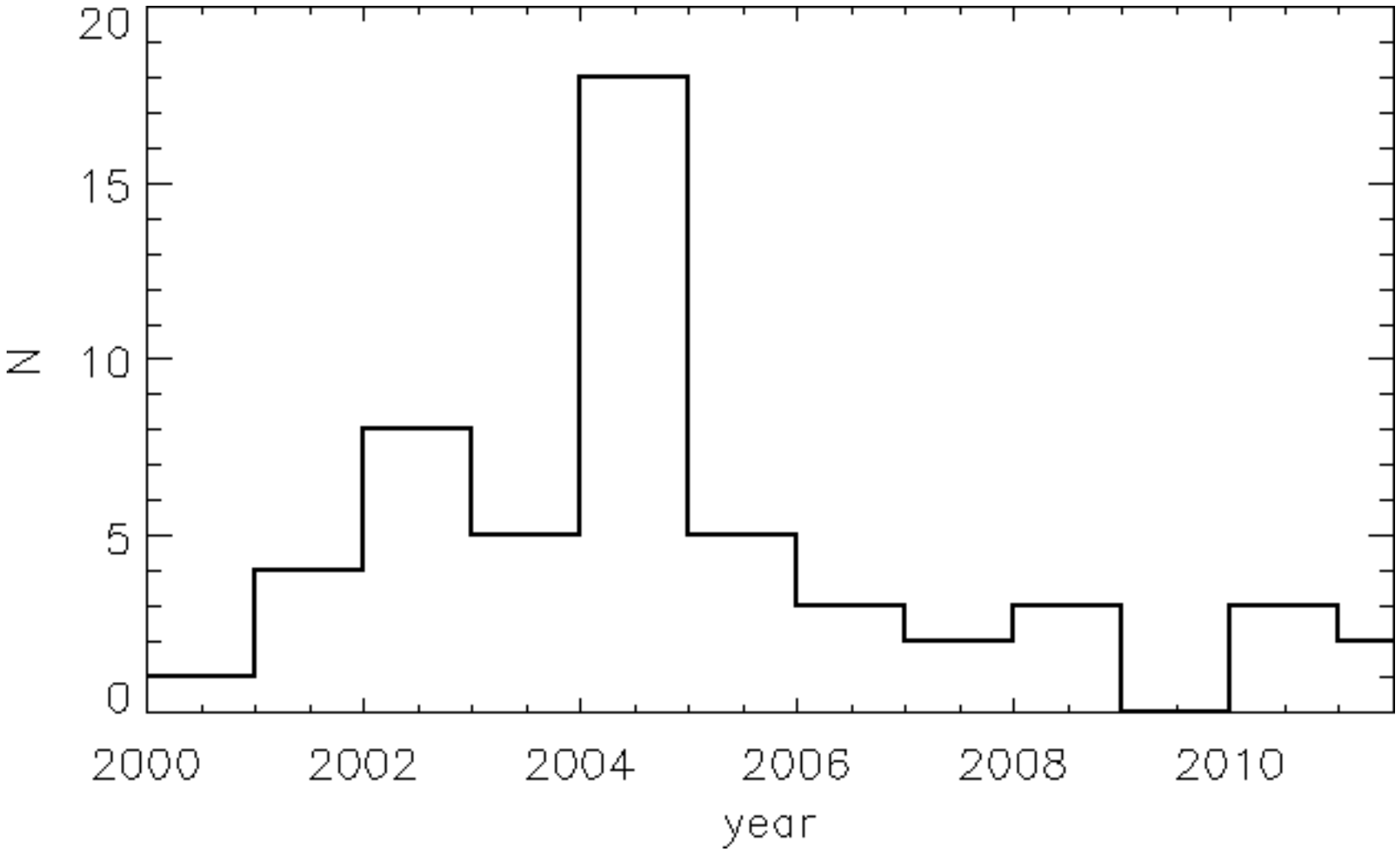
# Jupiter Flyby, 30/12/2000, @ 138 Rj = $10^7$ km, 6 months of data: 1/10/2000 - 1/4/2001 + Galileo, HST, Chandra...






dusk/evening side magnetosphere explored

# 54 papers published from 2000 to 2011



- CASSINI FLY-BY

Hill
Magnetic Moments at Jupiter
Nature 02/2002

Bolton et al.
Cassini/Huygens flyby of the Jovian system
JGR 09/2004

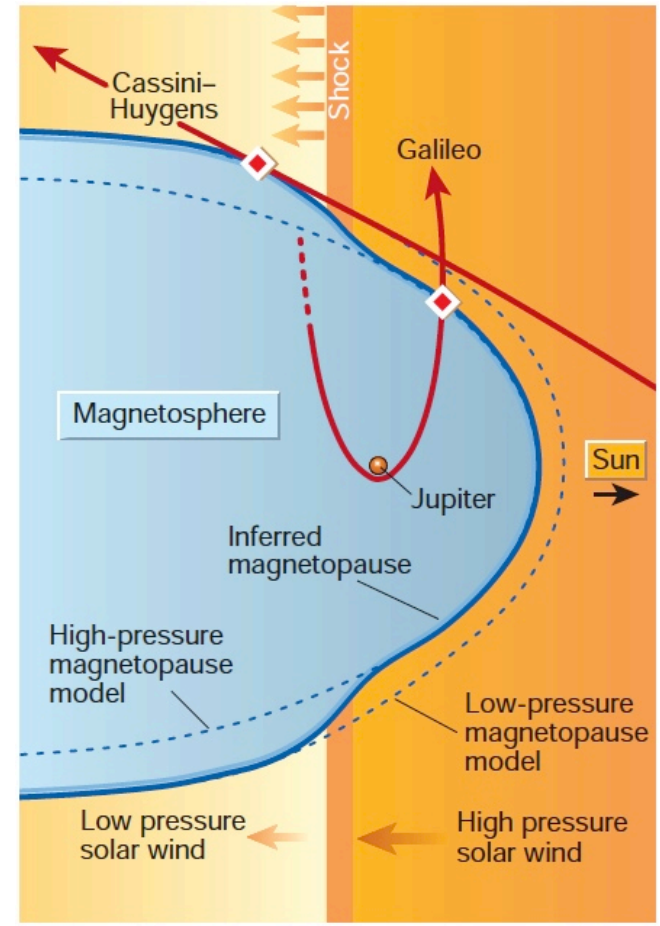
Hansen et al.
The Cassini-Huygens flyby of Jupiter
Icarus 11/2004

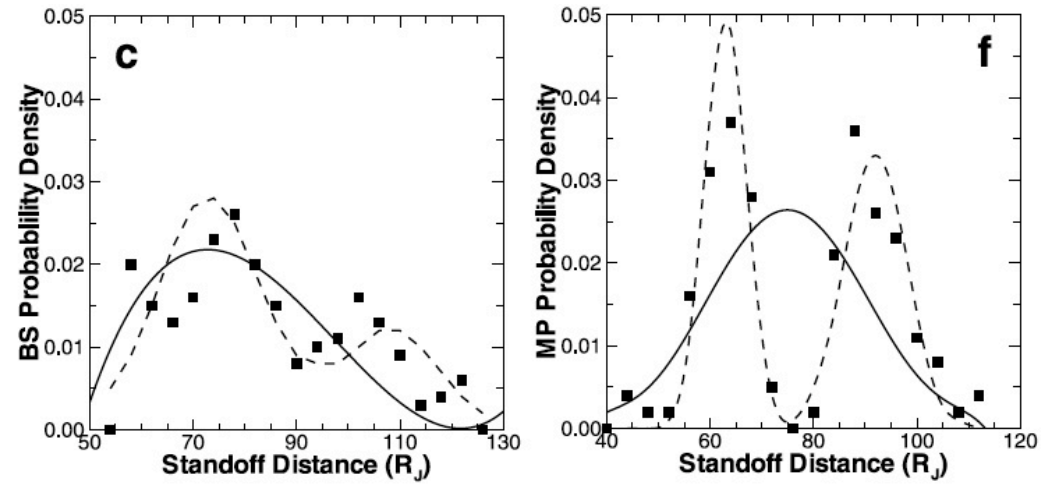
• PRE-SHOCK, MAGNETOSHEATH, MAGNETOPAUSE

Kurth et al.
The dusk flank of Jupiter'smagnetosphere
Nature 02/2002

Joy et al.
Probabilistic models of the Jovian magnetopause and bow shock locations
JGR 10/2002

Hanlon et al.
Dual spacecraft observations of a compression event within the Jovian magnetosphere:
Signatures of externally triggered supercorotation?
JGR 07/2004



André et al.
Overview of mirror mode fluctuations in the jovian dusk magnetosheath: Cassini magnetometer observations
GRL 10/2002

Szego et al.
Cassini plasma spectrometer measurements of Jovian bow shock structure
JGR 07/2003

Kivelson & Southwood
First evidence of IMF control of Jovian magnetospheric boundary locations: Cassini and Galileo magnetic field measurements compared
P&SS 11/2003

Bz

Svenes et al.
Cassini Plasma Spectrometer electron measurements close to the magnetopause of Jupiter
JGR 06/2004

Achilleos et al.
Magnetic signatures of Jupiter's bow shock during the Cassini flyby
JGR 06/2004

fast magnetosonic

Szego et al.
A pre-shock event at Jupiter on 30 January 2001
P&SS 02/2006

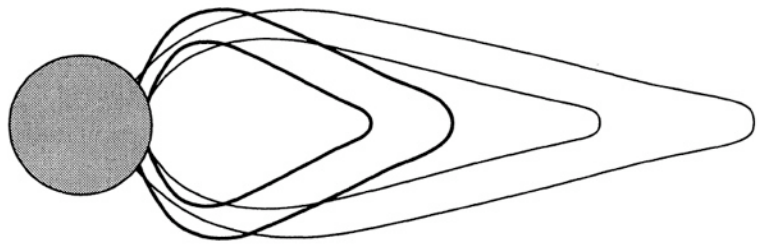
Nichols et al.
Magnetopause reconnection rate estimates for Jupiter's magnetosphere based on interplanetary measurements at ~5 AU
AnnGeo 03/2006

Bebesi et al.
Slow-mode shock candidate in the Jovian magnetosheath
P&SS 04/2010

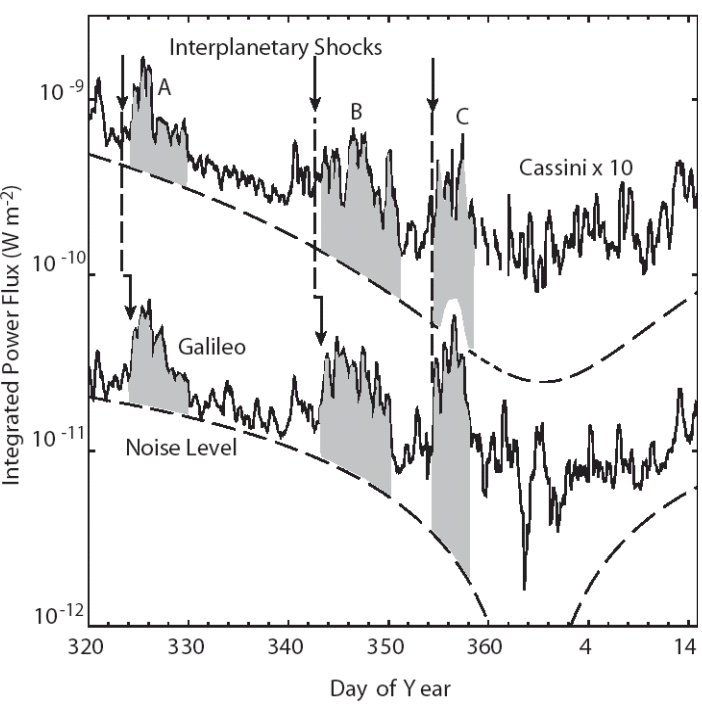
+ Comment by Hubert et al. & Response, P&SS 04/2011

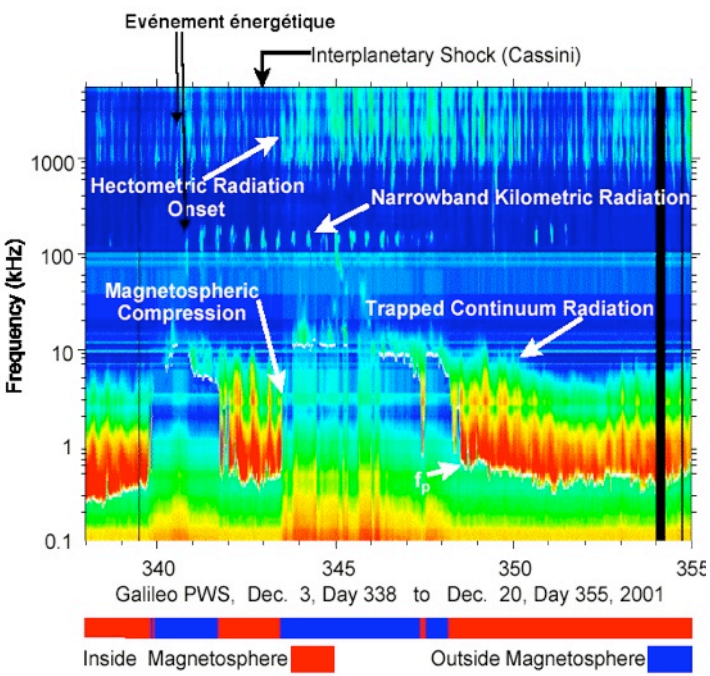
• MAGNETOSPHERIC DYNAMICS

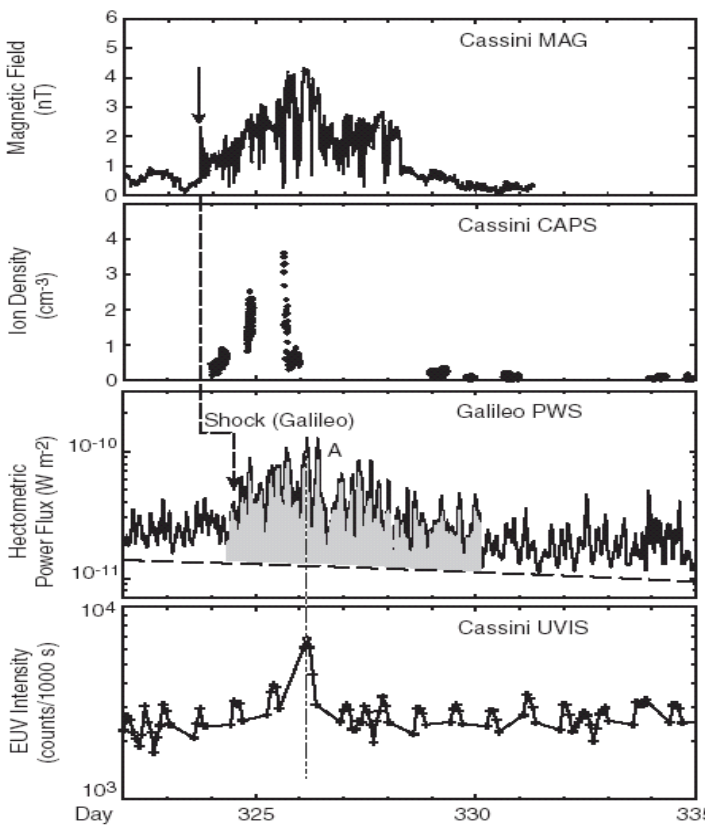
Southwood & Kivelson
A new perspective concerning the influence of the solar wind on the Jovian magnetosphere
JGR 04/2001



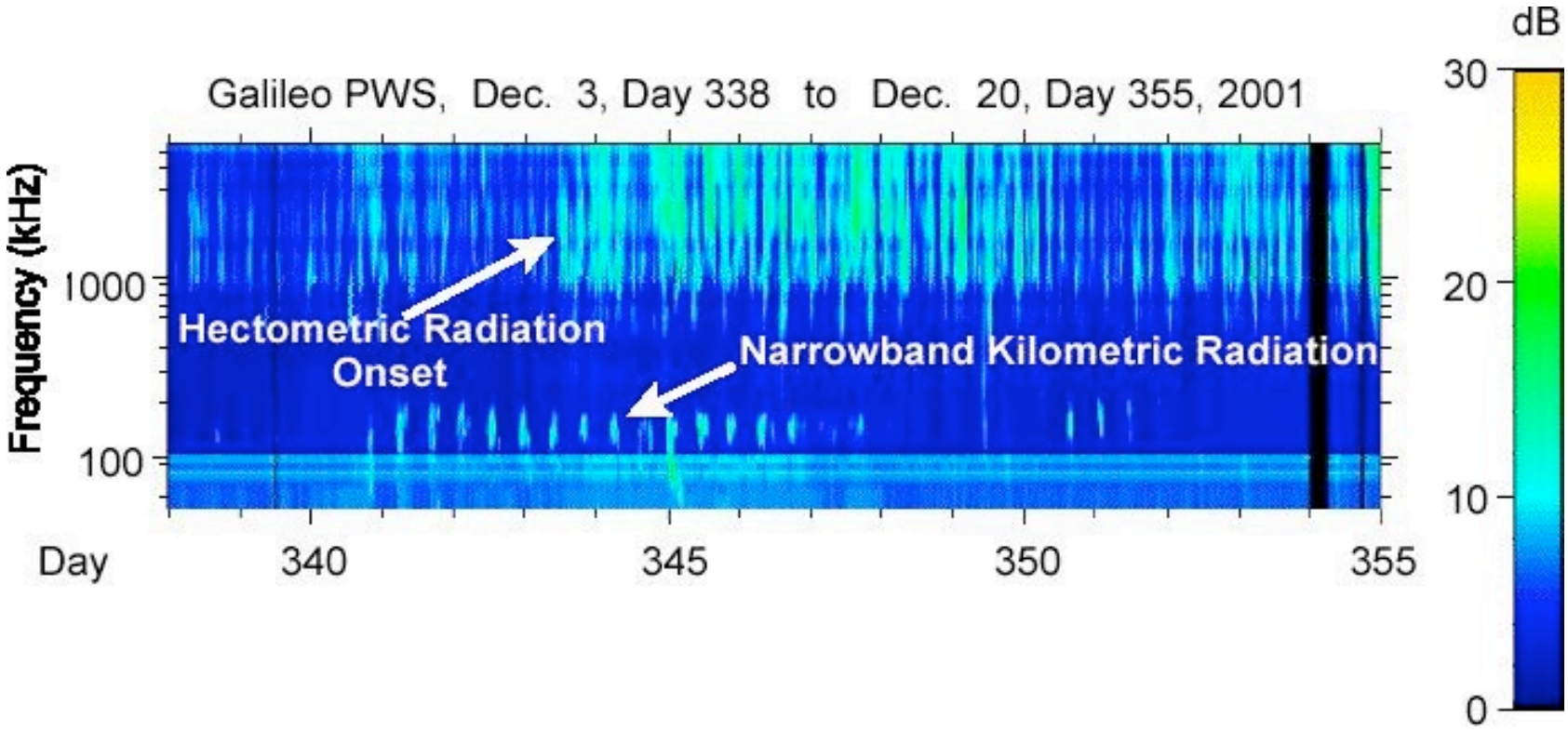
Gurnett et al.
Control of Jupiter's radio emission and aurorae by the solar wind
Nature 02/2002



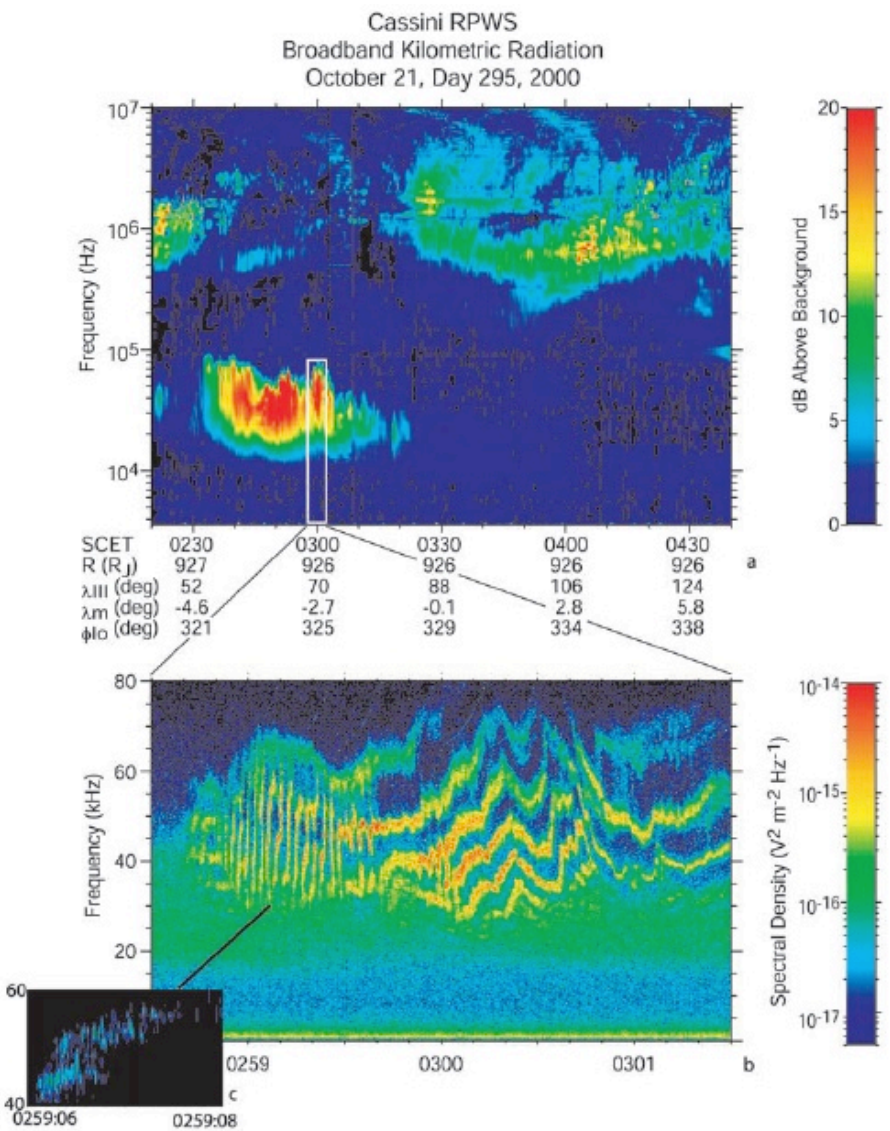



Louarn et al.
Observation of similar radio signatures at Saturn and Jupiter: Implications for the magnetospheric dynamics
GRL 10/2007

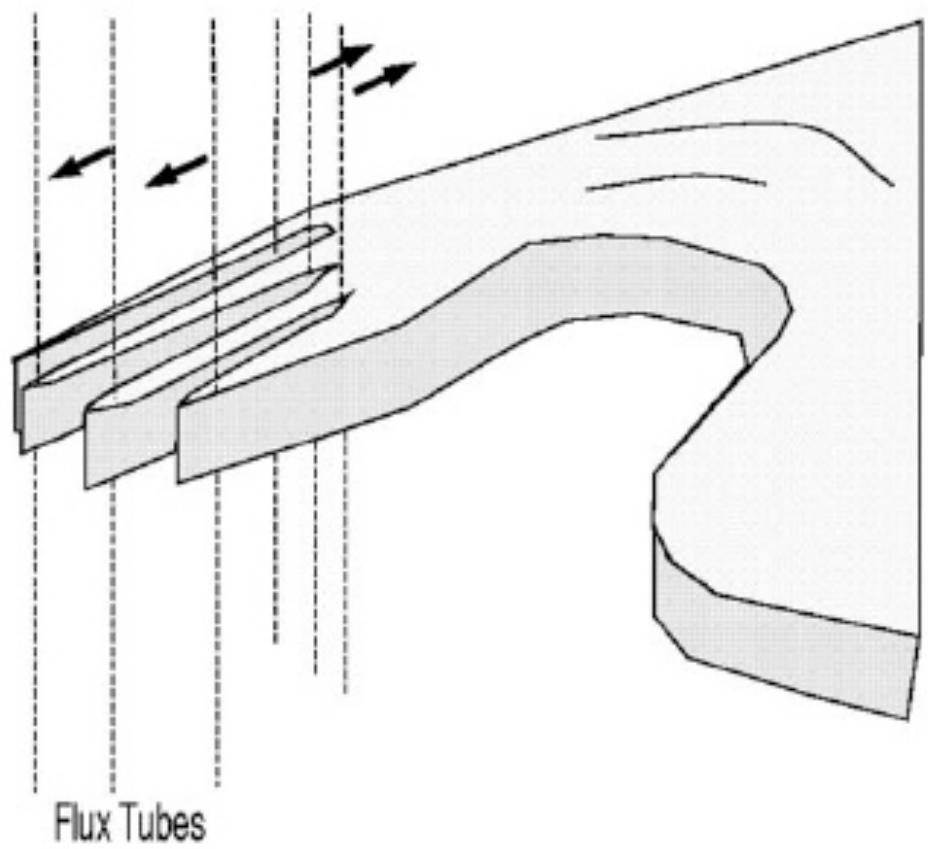



"energetic events" = intensifications of HOM, bKOM, nKOM + thinnings/thickenings of equatorial plasma sheet at 3 to 7 days intervals → centrifugal ejections from Io torus ? SW triggered ? global or local ?

Farrell et al.
Remote sensing of possible plasma density bubbles in the inner Jovian dayside magnetosphere
JGR 07/2004

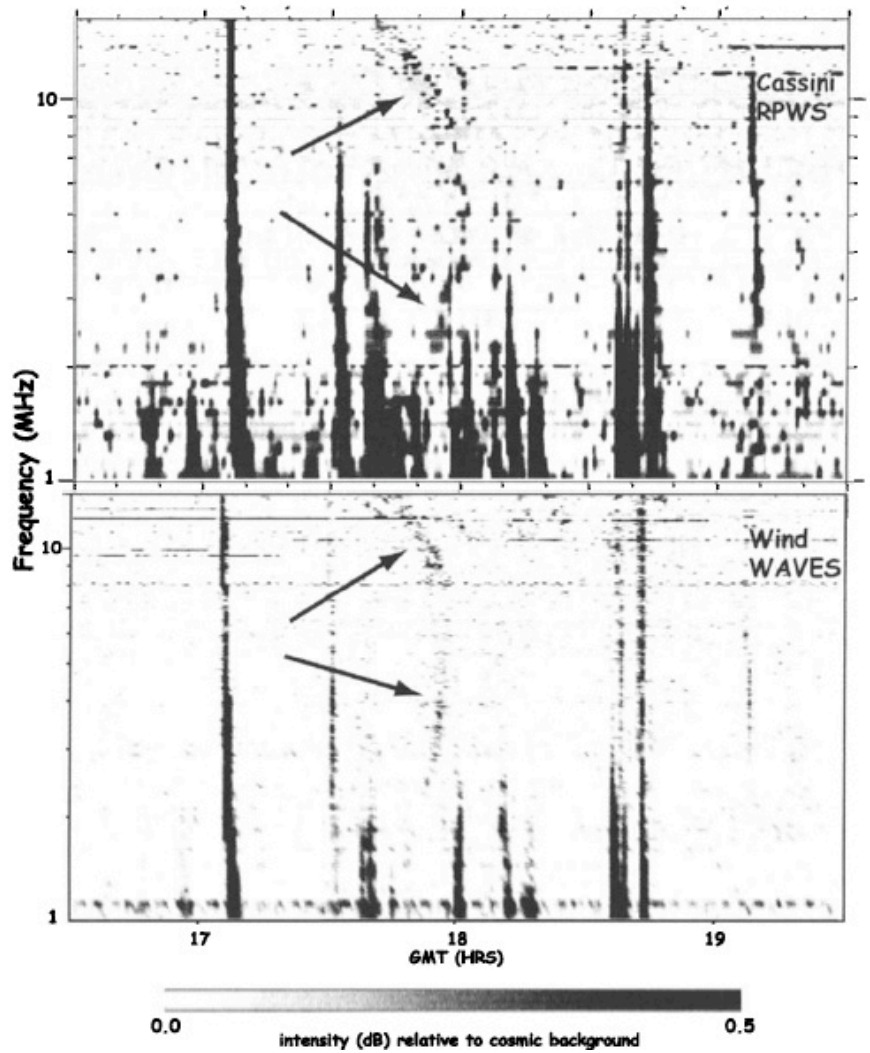



fp ~ (n+1/2)fce ?



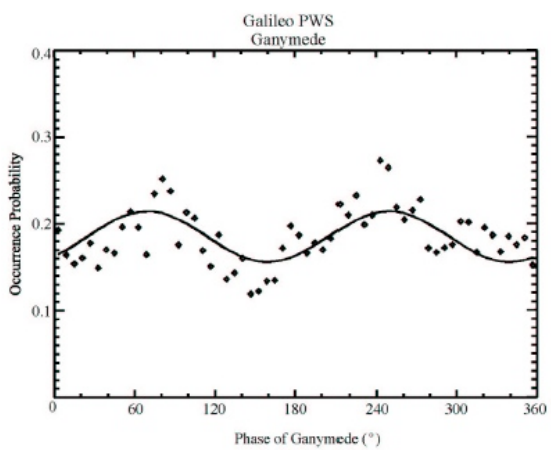
• RADIO - DAM...

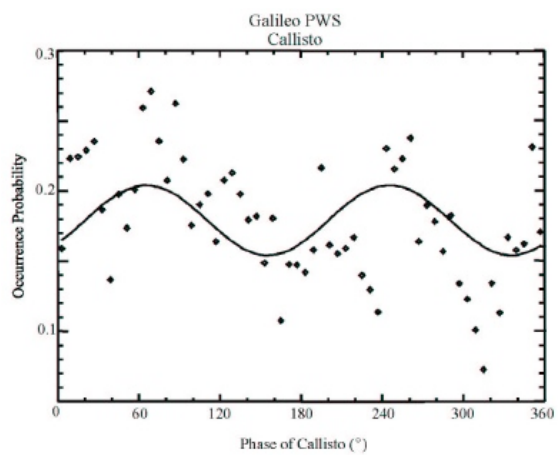
Kaiser et al.
Cassini and Wind stereoscopic observations of Jovian nonthermal radio emissions: Measurement of beam widths
JGR 07/2000 1.5°±0.5° cone



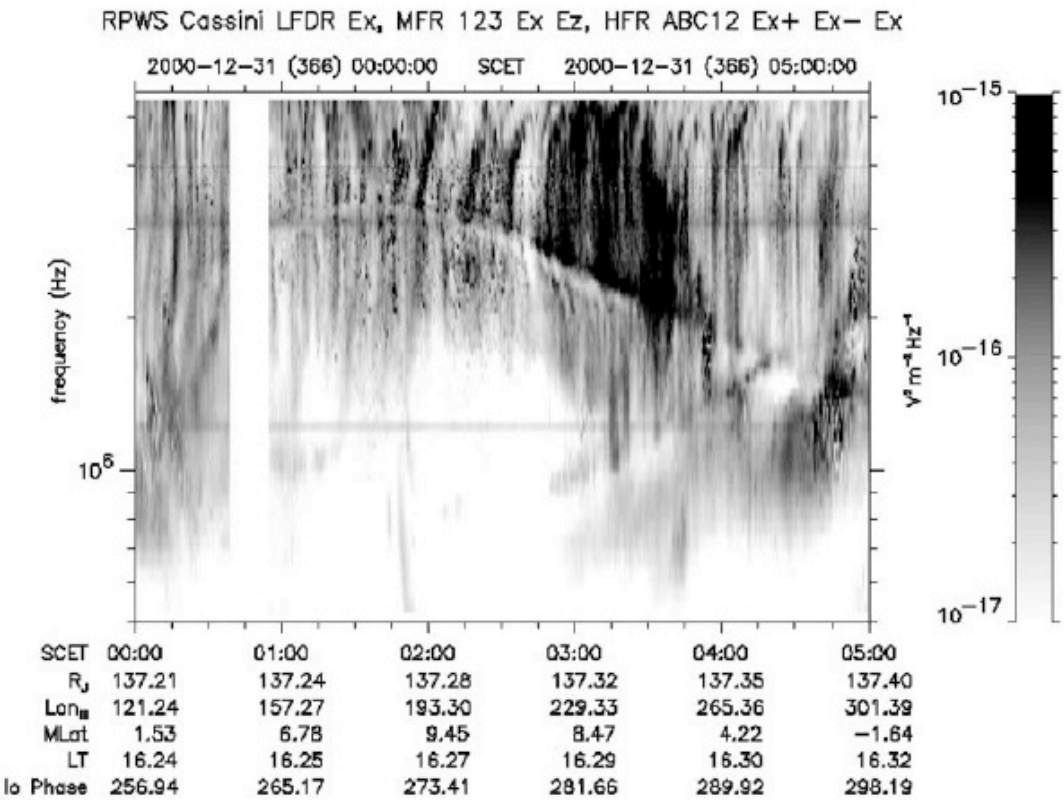

Rucker et al.
Developments in Jovian Radio Emissions Tomography and Observations Techniques
Ap&SS 06/2001

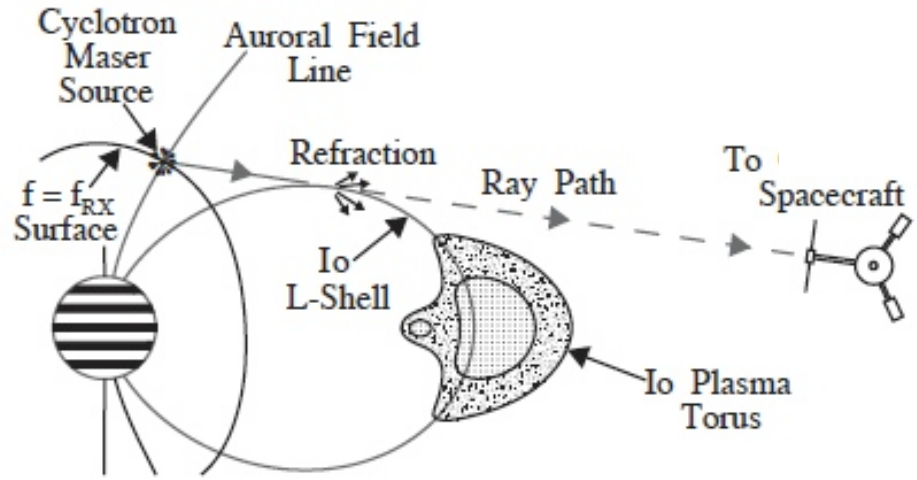
Hospodarsky et al.
Control of Jovian Radio Emissions by the Galilean Moons as Observed by Cassini and Galileo
PREV 2001



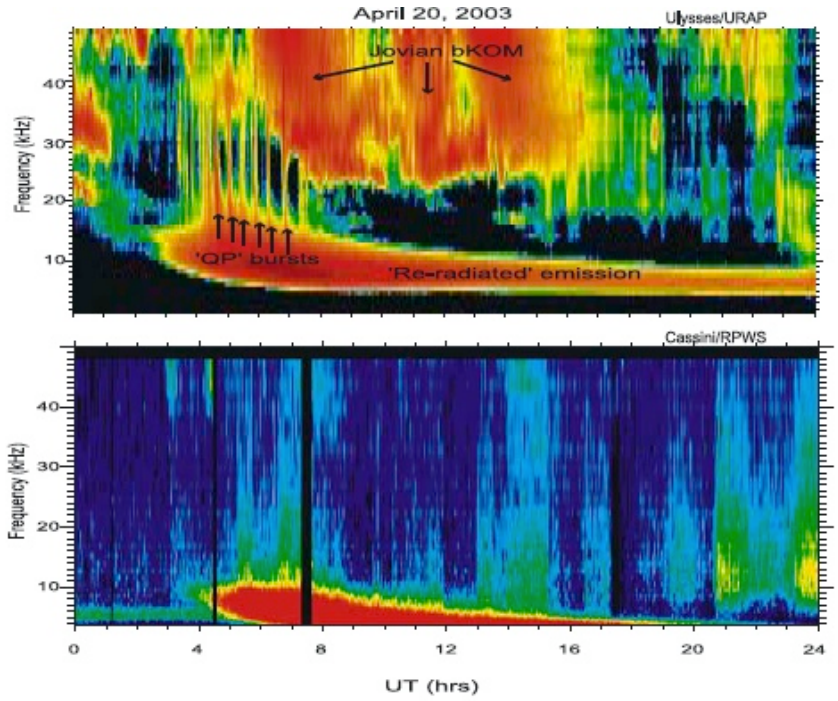
Menietti et al.
Modeling radio emission attenuation lanes observed by the Galileo and Cassini spacecraft
P&SS 08/2003

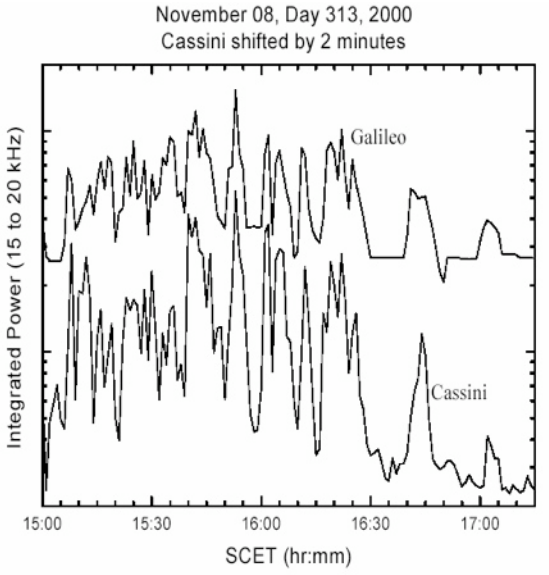


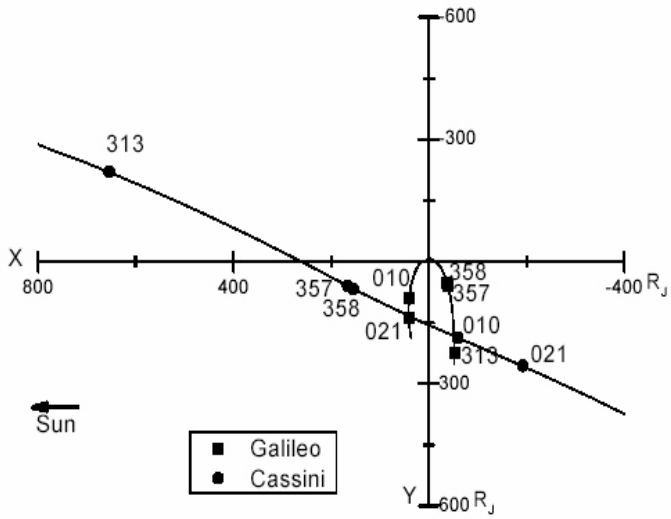



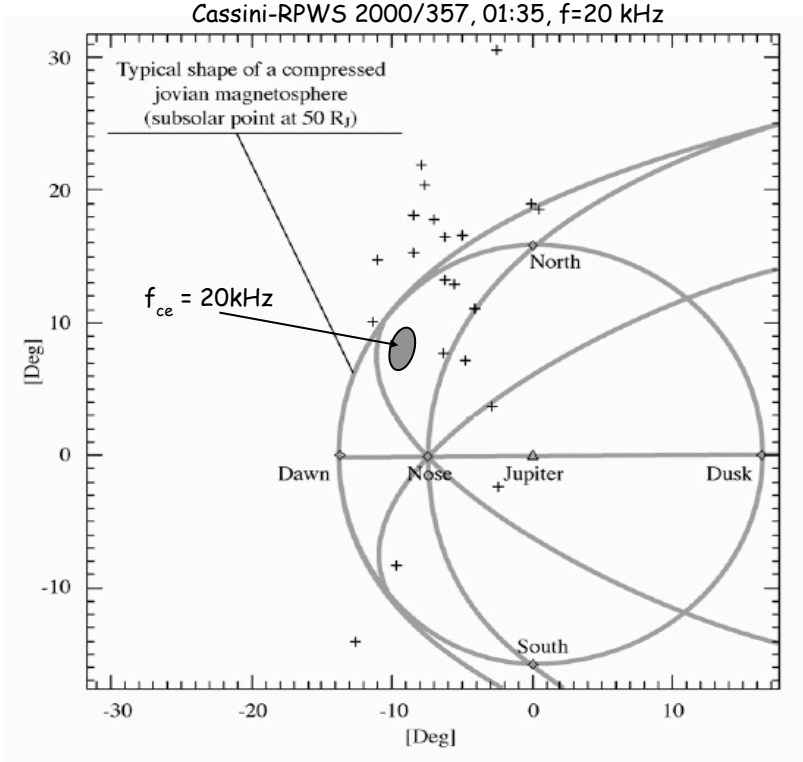
Kaiser et al.
New observations from Cassini and Ulysses of Jovian VLF radio emissions
JGR 06/2004

Hospodarsky et al.
Simultaneous observations of Jovian quasi-periodic radio emissions by the Galileo and Cassini spacecraft
JGR 06/2004

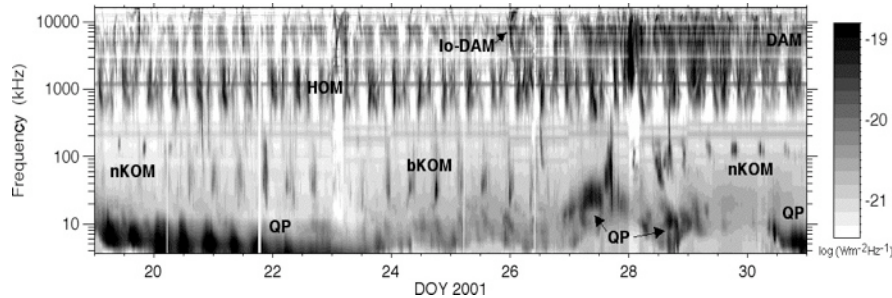


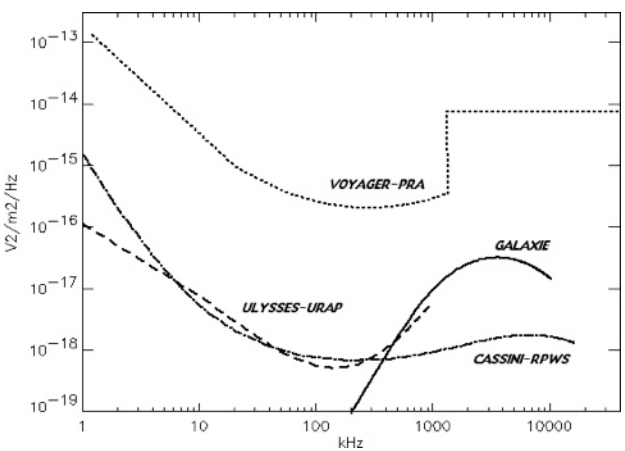



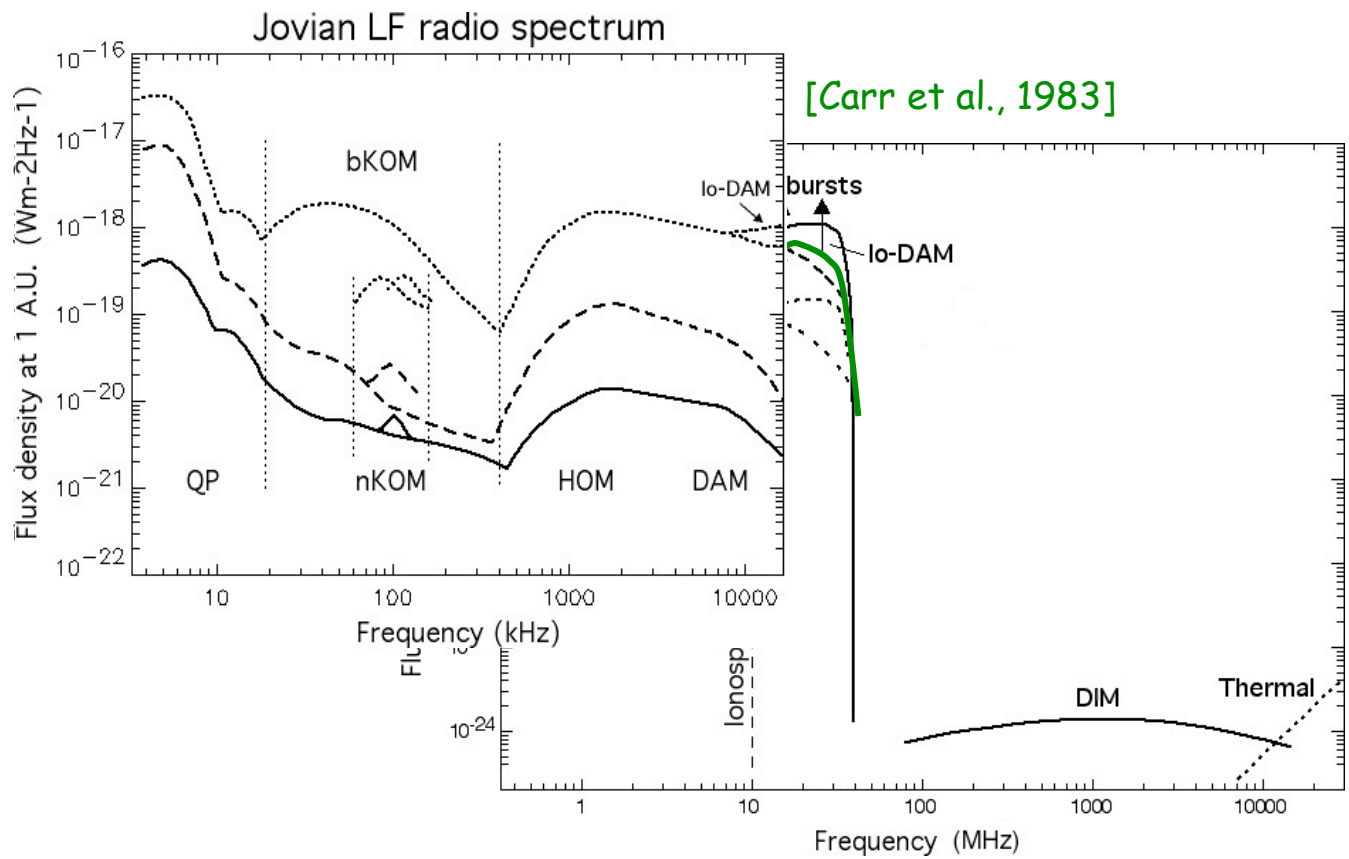



Vogl et al.
In-flight calibration of the Cassini-Radio and Plasma Wave Science (RPWS) antenna system for direction-finding and polarization measurements
JGR 07/2004



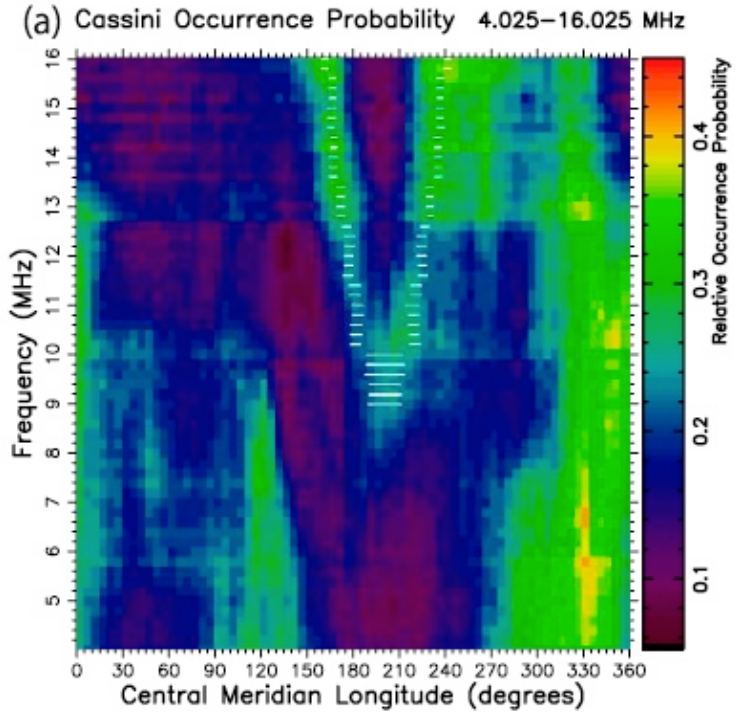

Zarka et al.
Jupiter's low-frequency radio spectrum from Cassini/Radio and Plasma Wave Science (RPWS) absolute flux density measurements
JGR 08/2004



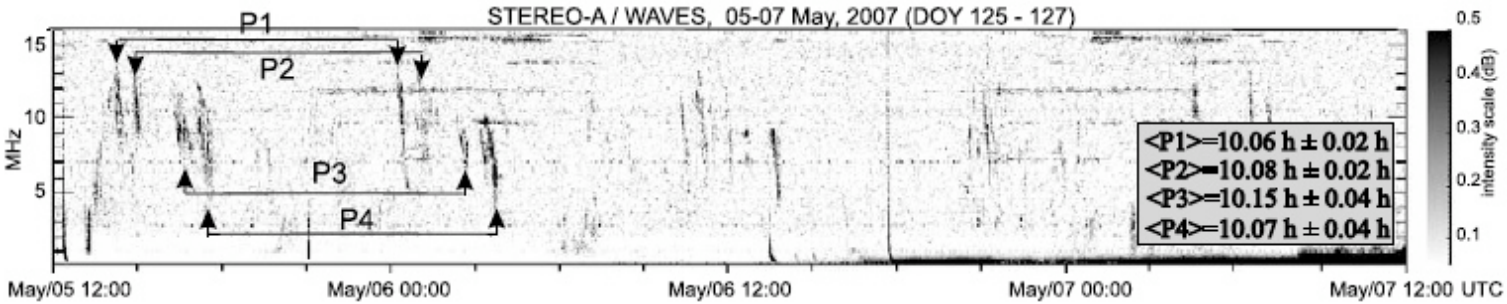



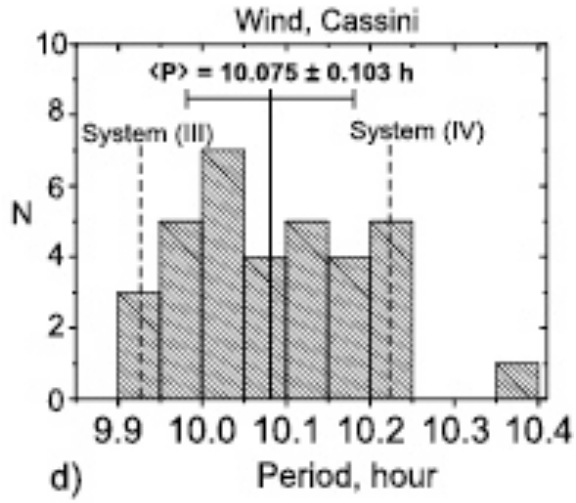
Zarka & Kurth
Radio Wave Emission from the Outer Planets Before Cassini
SSR 01/2005

Imai et al.
Angular beaming model of Jupiter's decametric radio emissions based on Cassini RPWS data analysis
GRL 09/2008



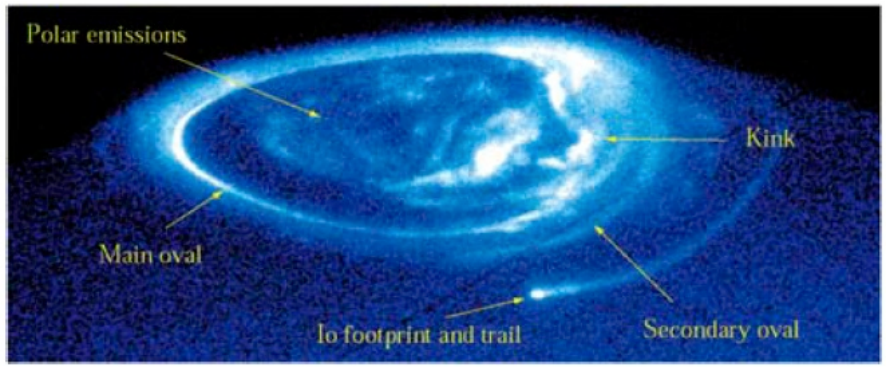

Panchenko et al.
New periodicity in Jovian decametric radio emission
GRL 03/2010

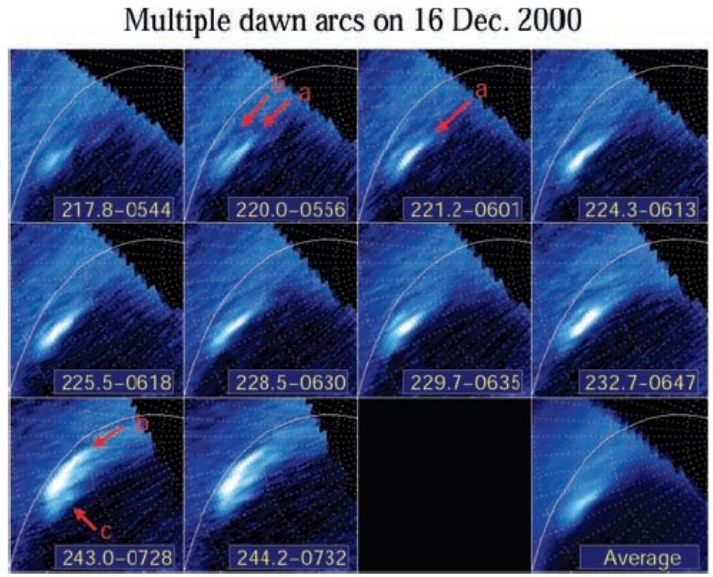


• UV/VISIBLE AURORA

Grodent et al.
Jupiter's main auroral oval observed with HST-STIS
JGR 11/2003




Ajello et al.
The Cassini Campaign observations of the Jupiter aurora by the Ultraviolet Imaging Spectrograph and the Space Telescope Imaging Spectrograph
Icarus 11/2005

→e- energies

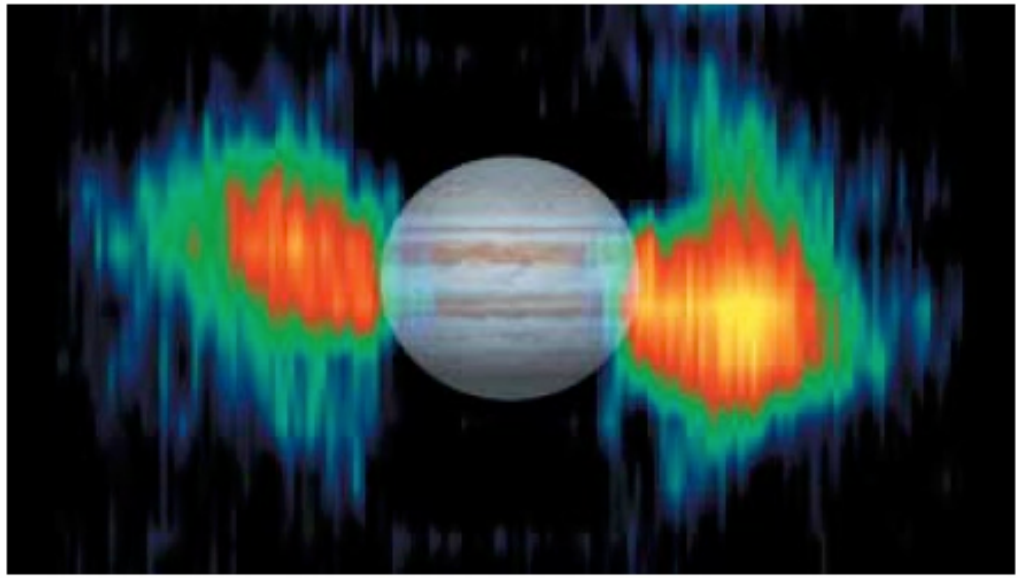
Pryor et al.
Cassini UVIS observations of Jupiter's auroral variability
Icarus 11/2005

Nichols et al.
Response of Jupiter's UV auroras to interplanetary conditions as observed by the Hubble Space Telescope during the Cassini flyby campaign
JGR 02/2007

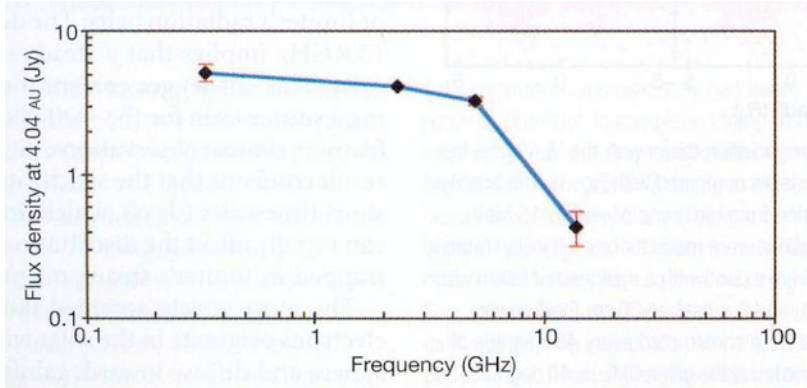
???

• RADIATION BELTS

Bolton et al.
Ultra-relativistic electrons in Jupiter's radiation belts
Nature 02/2002



Kloosterman et al.
VLA observations of synchrotron radiation at 15 GHz
Icarus 02/2008



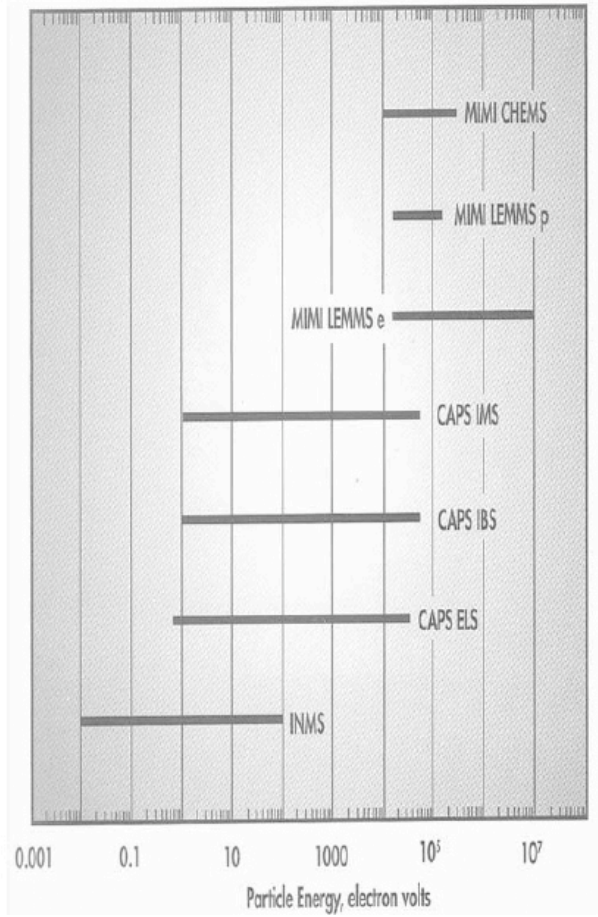

Cassini observations at 13.8 GHz (2.2 cm)
→ 50 MeV electrons

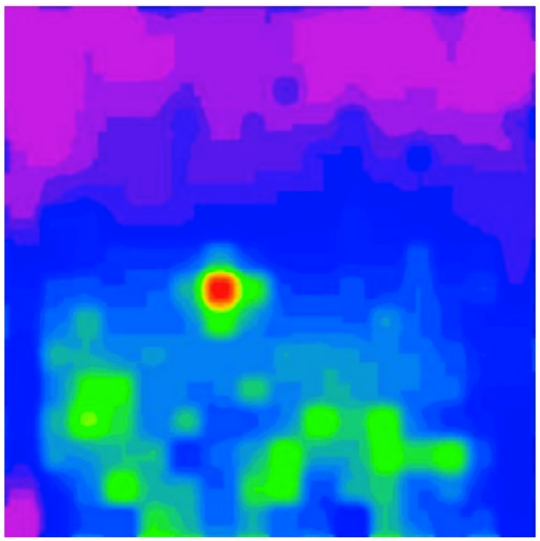
*Tomaschitz*
*Tachyonic synchrotron radiation*
*PhysA 04/2004*

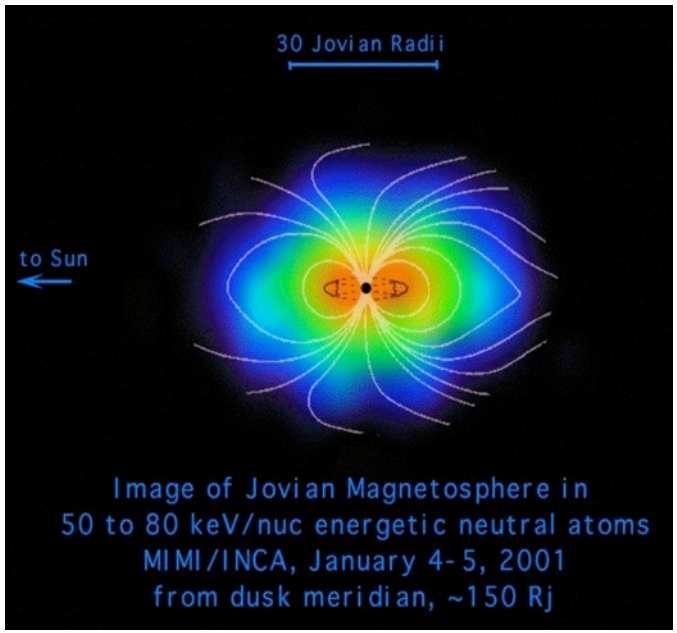
• ENERGETIC PARTICLES

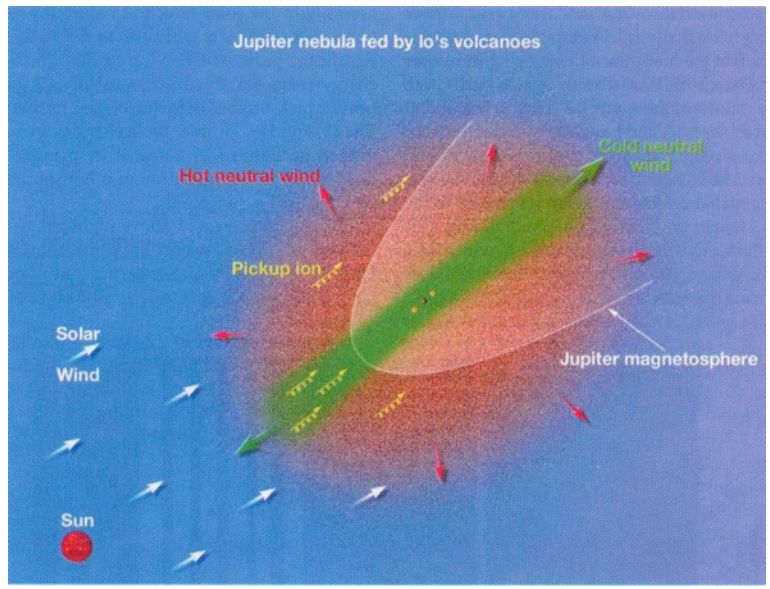
Krimigis et al.
A nebula of gases from Io surrounding Jupiter
Nature 02/2002

Mitchell et al.
Energetic neutral atoms from Jupiter measured with the Cassini magnetospheric imaging instrument: Time dependence and composition
JGR 07/2004





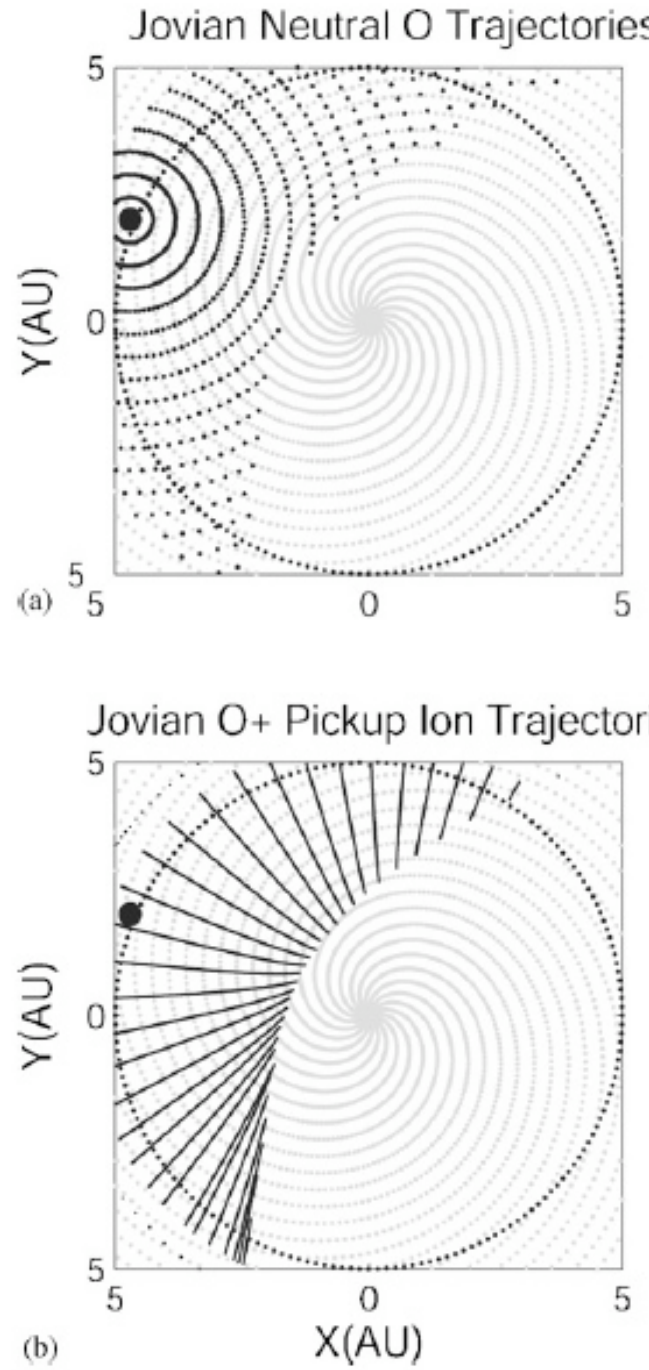



Krupp et al.
Leakage of energetic particles from Jupiter's dusk magnetosphere: Dual spacecraft observations
GRL 08/2002

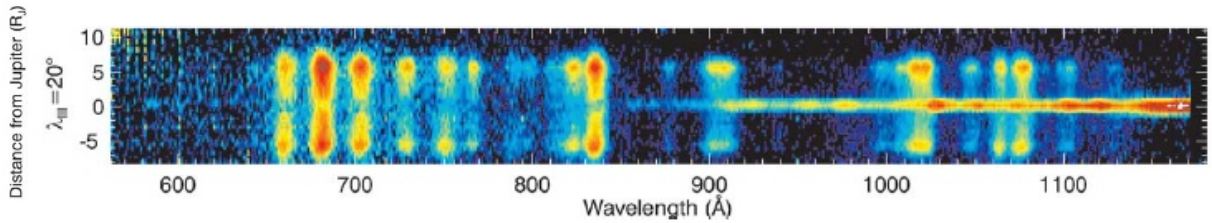
Luhmann
Expected heliospheric attributes of Jovian pickup ions from the extended neutral gas disk
P&SS 05/2003

Mauk et al.
Energetic ion characteristics and neutral gas interactions in Jupiter's magnetosphere
JGR 07/2004

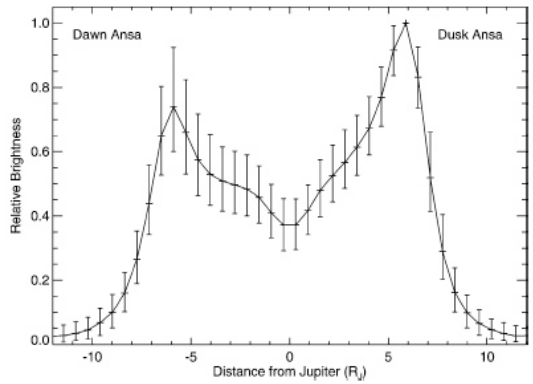
Krupp et al.
Energetic particle observations in the vicinity of Jupiter: Cassini MIMI/LEMMS results
JGR 08/2004



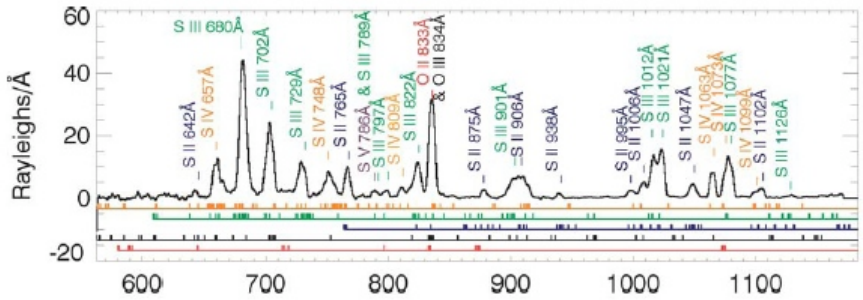
• IO PLASMA TORUS



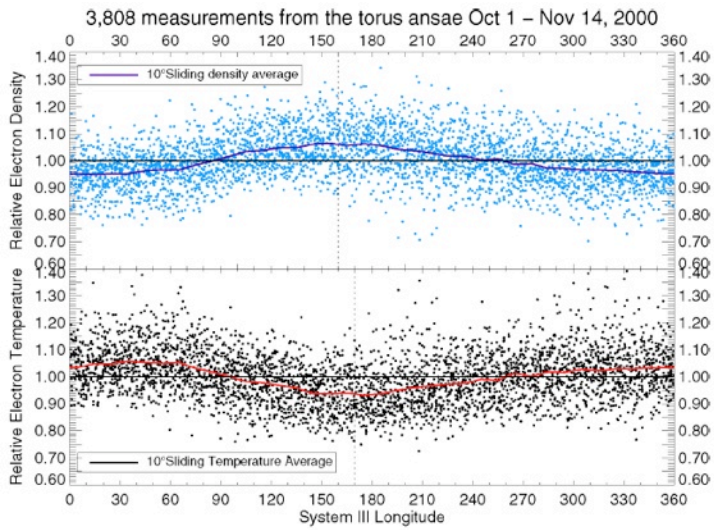

Steffl et al.
Cassini UVIS observations of the Io plasma torus.
I. Initial results
Icarus 11/2004a




Steffl et al.
Cassini UVIS observations of the Io plasma torus.
II. Radial variations
Icarus 11/2004b




Steffl et al.
Cassini UVIS observations of the Io plasma torus.
III. Observations of temporal and azimuthal variability
Icarus 01/2006



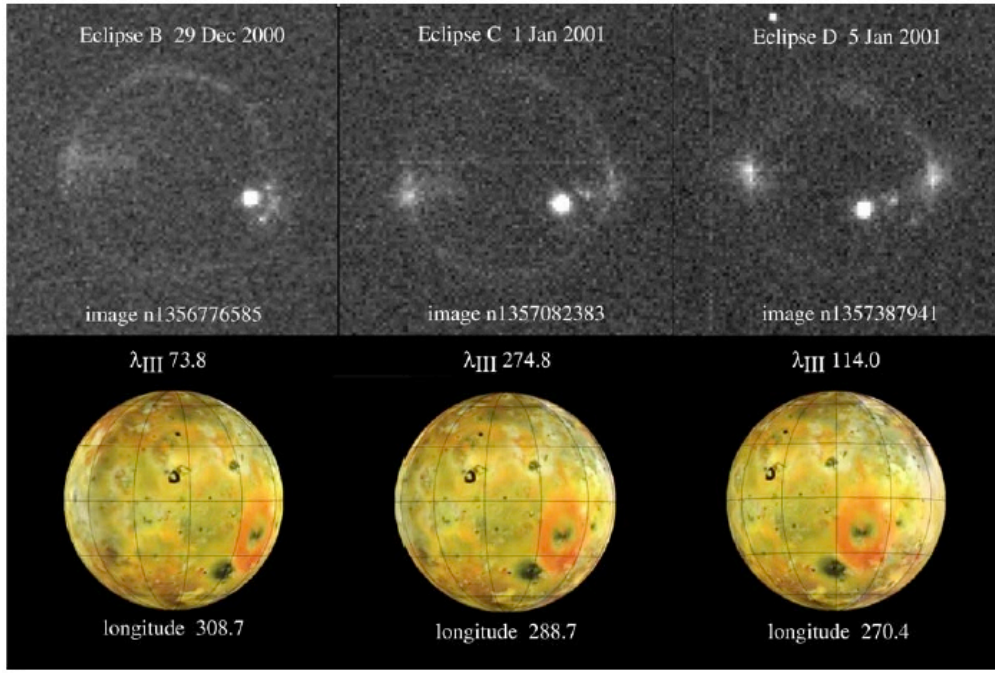
Delamere et al.
Modeling temporal variability of plasma conditions in the Io torus during the Cassini era
JGR 10/2004

Delamere et al.
Radial variations in the Io plasma torus during the Cassini era
JGR 12/2005
01/2006

Steffl et al.
Cassini UVIS observations of the Io plasma torus. IV. Modeling temporal and azimuthal variability
Icarus 03/2008

• IO'S AURORA

Geissler et al.
Cassini observations of Io's visible aurorae
Icarus 11/2004




• EUROPA'S TORUS

Hansen et al.
Cassini UVIS observations of Europa's oxygen atmosphere and torus
Icarus 08/2005

O2+sputtering → O → torus ?

• RINGS

Horányi & Juhász
Plasma conditions and the structure of the Jovian ring
JGR 09/2010

short lifetime,
micrometeoroid
bombardment

*Plus que 54 articles à lire et vous saurez tout !*