

# IRAP Node

- TRANSPLANET
  - <http://transplanet.irap.omp.eu/>
- Online access to IPIM model
  - Available for  $\neq$  planets
  - Restricted access
    - ✓ Photoionization
    - ✓ Species
      - Neutrals (not solved)
      - Ions
- Multiple flux tubes
- Batch runs
  - Email for completion
- Data in different formats
  - Open data access
  - Full parameters
    - ✓ Binary IPIM format
  - Main parameters
    - ✓ NetCDF
    - ✓ CDF

**REQUEST A NEW RUN**

Venus Earth Mars Jupiter

**USER**

Email (where we'll send the run results)  Description (optional, but recommended)

**SPECIES**

H  N  H<sup>+</sup>  N<sup>+</sup>  
 O  N<sub>2</sub>  O<sup>+</sup>  N<sub>2</sub><sup>+</sup>  
 O<sub>2</sub>  NO<sup>+</sup>  O<sub>2</sub><sup>+</sup>

**TIMESPAN**

Simulation start date (YYYY-MM-DD)  Simulation start time (HH:MM:SS)

Simulation duration (HH:MM:SS)  Output time interval (s)

**KINETICS**

Compute Photoionization  Compute electron precipitation

**MAGNETIC FIELD**

Magnetic field model

**NEUTRAL ATMOSPHERE**

Atmospheric profile

**LOCATION #1**

Coordinates frame

Longitude  Latitude

**LOCATION #2**  DISABLED

(a)

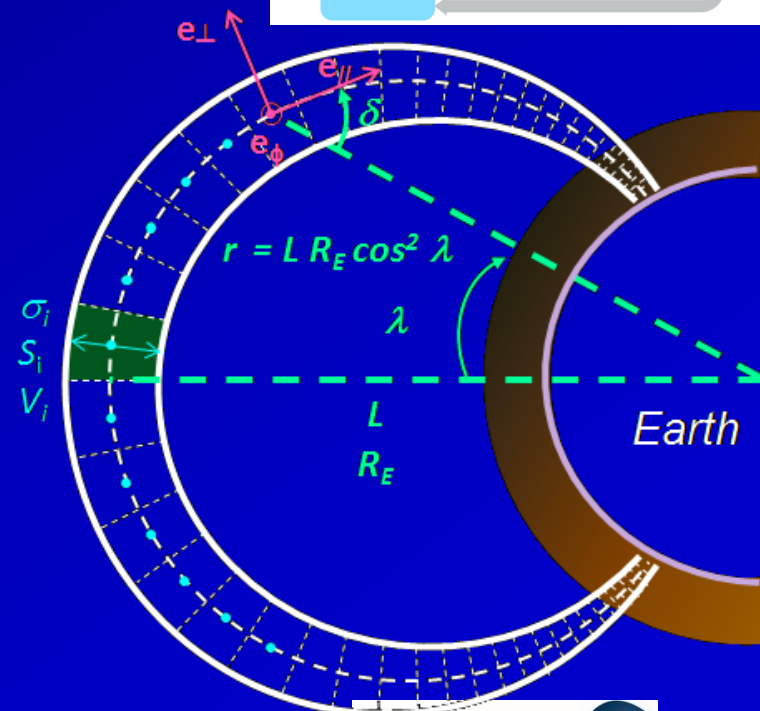
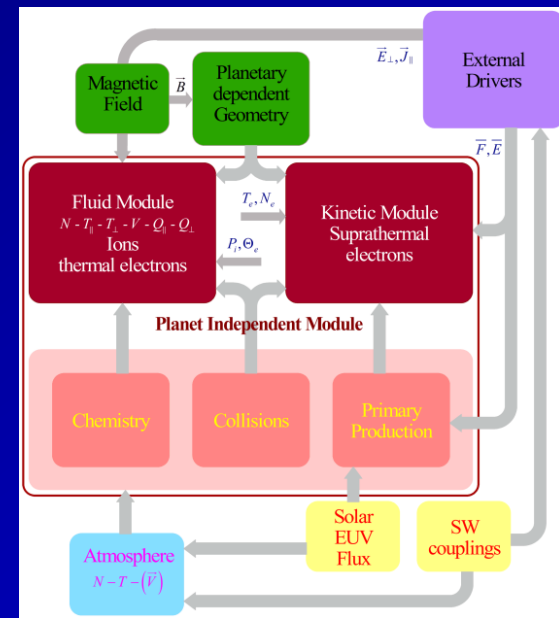
(b)

(c)



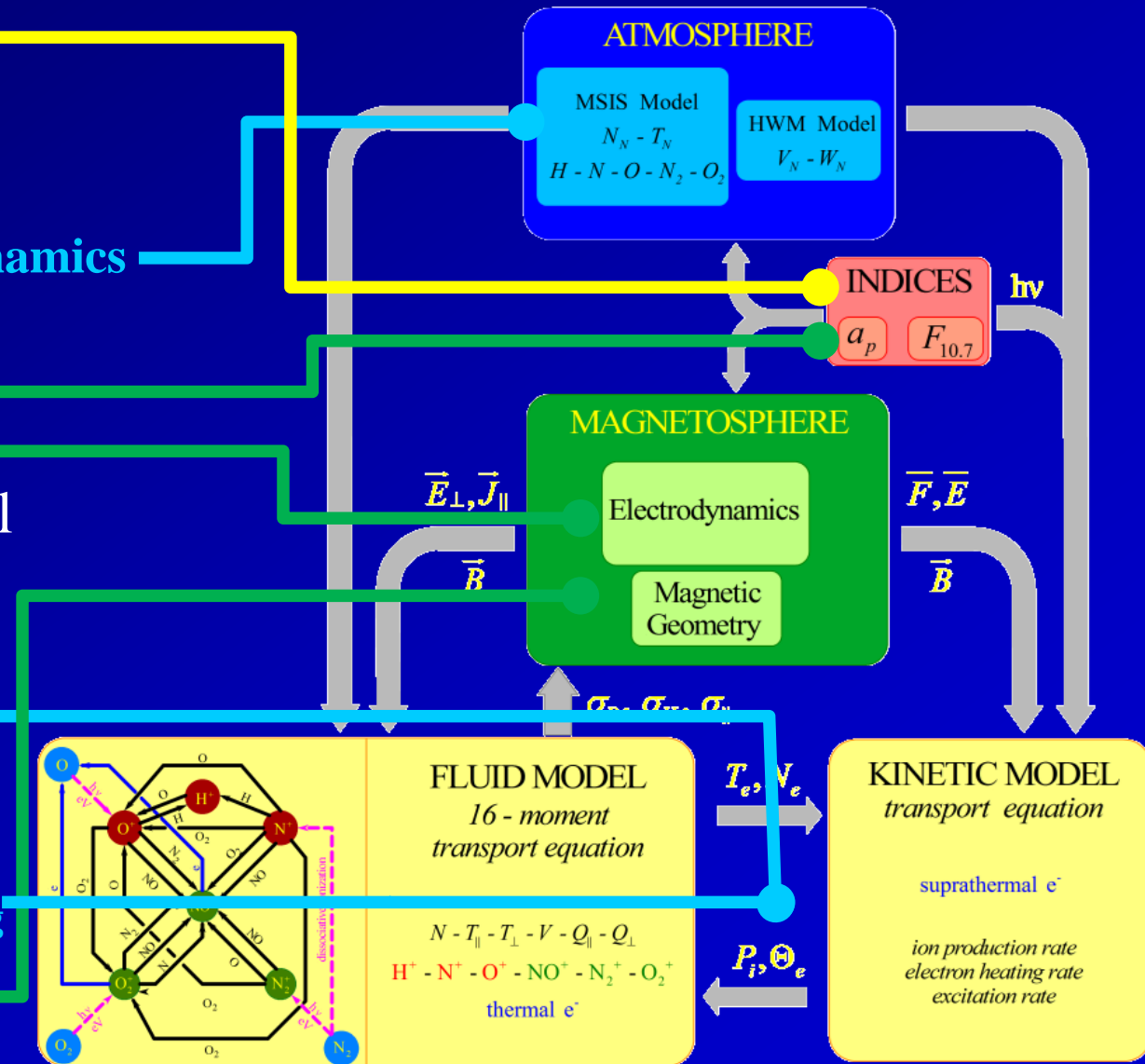
# *IPIM features*

- Interhemispheric model
  - ionosphere-plasmasphere description
    - ✓ at mid- and low- latitudes
  - transport equations solved along flux tubes
    - ✓ closed magnetic field line : interhemispheric
    - ✓ open magnetic field line : High latitude
  - Coverage
    - ✓ latitudes
      - interhemispheric:  $10^\circ < |Mlat| < 60^\circ$
      - High latitude:  $>60^\circ$
    - ✓ Altitudes
      - Minimum: 80-90 km
      - interhemispheric  $6 R_E$
      - High latitude  $\leq 6 R_E$
  - Magnetic field lines
    - ✓ Tilted and eccentric dipole



# ***IPIM architecture***

- Sun
  - **Activity**
- Inputs to the model
  - **Atmosphere**
    - ✓ Structure and dynamics
  - **Magnetosphere**
    - ✓ Activity
    - ✓ Electrodynamics
- Outputs from the model
  - **Atmosphere**
    - ✓ Production rates
      - Ions
      - Excited states
    - ✓ Heating rates
      - Joule heating
      - Electron heating
  - **Magnetosphere**



# *IRAP commitments*

- Guaranteed access to **TRANSPLANET** Webservice
  - Maintenance
  - Software update
    - ✓ Processes
    - ✓ Species
    - ✓ Run facilities (lifting of restriction)
- User support
  - Best effort
  - Run preparation
    - ✓ Run definition : input data
    - ✓ Description of output data
  - Run analysis
    - ✓ Description of the model and equations / parameters solved
    - ✓ Support to data access and display
    - ✓ No commitment to assist in the interpretation of results
- Hosting
  - **IRAP** can host researchers for scientific collaboration
    - ✓ Simulations with unbridled IPIM version
    - ✓ Data access with CDPP

