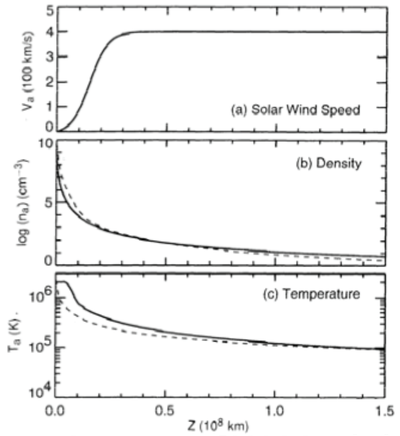
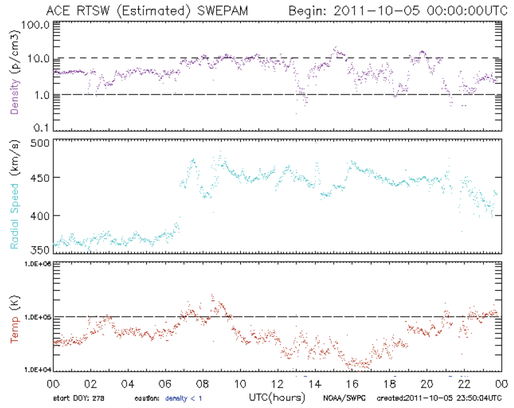
Solarwind-Heliosperic Imaging in Latitude and Longitude by Estimating Large-scale Attributes (SHILLELagh)

Input:
TIME RANGE
SPACE CRAFT
SPATIAL BOUNDS

SW_PROPAGATE: Use space craft data to estimate the properties of the solar wind at every point in the ecliptic plane.



Assume SW Model
(used in **CALC_HELIO_PROPS**)



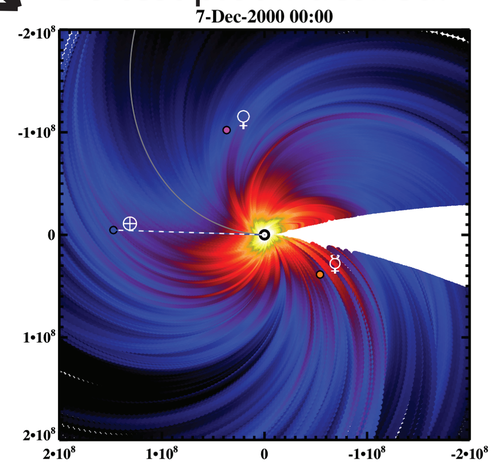
Load Space Craft Data
SW_GET_DATA

FOR EACH MODEL RUN:
- **O** initialize model box and other variables
- **O** fill time observed, velocity, magnetic field, density and temperature
- **O** calculate the "propagated" position of each observation using: R=Vel.*(time_obs-time_this)+R_spacecraft
- **O** use SW model to convert observations to "propagated" values (CALC_HELIO_PROPS)
- **O** calculate longitude of each observation using longitude of Earth at each observation time
- **O** assuming the SW is static, and a value for Sun's rotation speed, "propagate" observations along archimedean spirals (SW_SPIRAL)

SW_SPIRAL:
- **O** Reduce set to points between 0 and Max Radius of model box

FOR EACH OBSERVED POINT:
- **O** correct for (-) radii if necessary
- **O** initialize spiral arm array with Nelements determined from THETA_BIN
- **O** calculate propagated properties for each point along spiral
  - **O** longitude=longitude_observe + THETA_BIN
  - **O** R = R_observe - THETA_BIN * Velocity / sun_angular_rotation_speed
  - **O** Use CALC_HELIO_PROPS to calculate other properties along spiral
- **O** remove points propagated to (-) R values

Do test plot if desired:



Save propagated SW properties as compressed IDL ".sav" file.

NOTES:
*SW = Solar Wind
*Propagate = predicting what the properties of an observation (a point on the data graph) will be when it reaches a particular location. Each observed point is treated as a "blob" of plasma moving radially outward from the Sun. We assume that each longitude on the solar surface continues releasing blobs of plasma with the same properties.