Plan to make SLIMED calibration accessable

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SLIMED: A follow-on to ROLO model is published:
Multiple-instrument-based spectral irradiance of the Moon.
Jour. Applied Remote Sensing. Vol. 16, Issue 3
https://doi.org/10.1117/1.JRS.16.038502 Open Access

- Developed in IDL, requires a license. Need to convert to a public language
  - e.g., Python or some version of C.
- Now making IDL versions aimed at conversion. Generic routines.
  - All files are NetCDF, minimize executable code, more comments.
- Model is defined by the basis function symbols and coefficient values in Table 3 & 5.
  - Any revised model using the same scheme can use the same code!

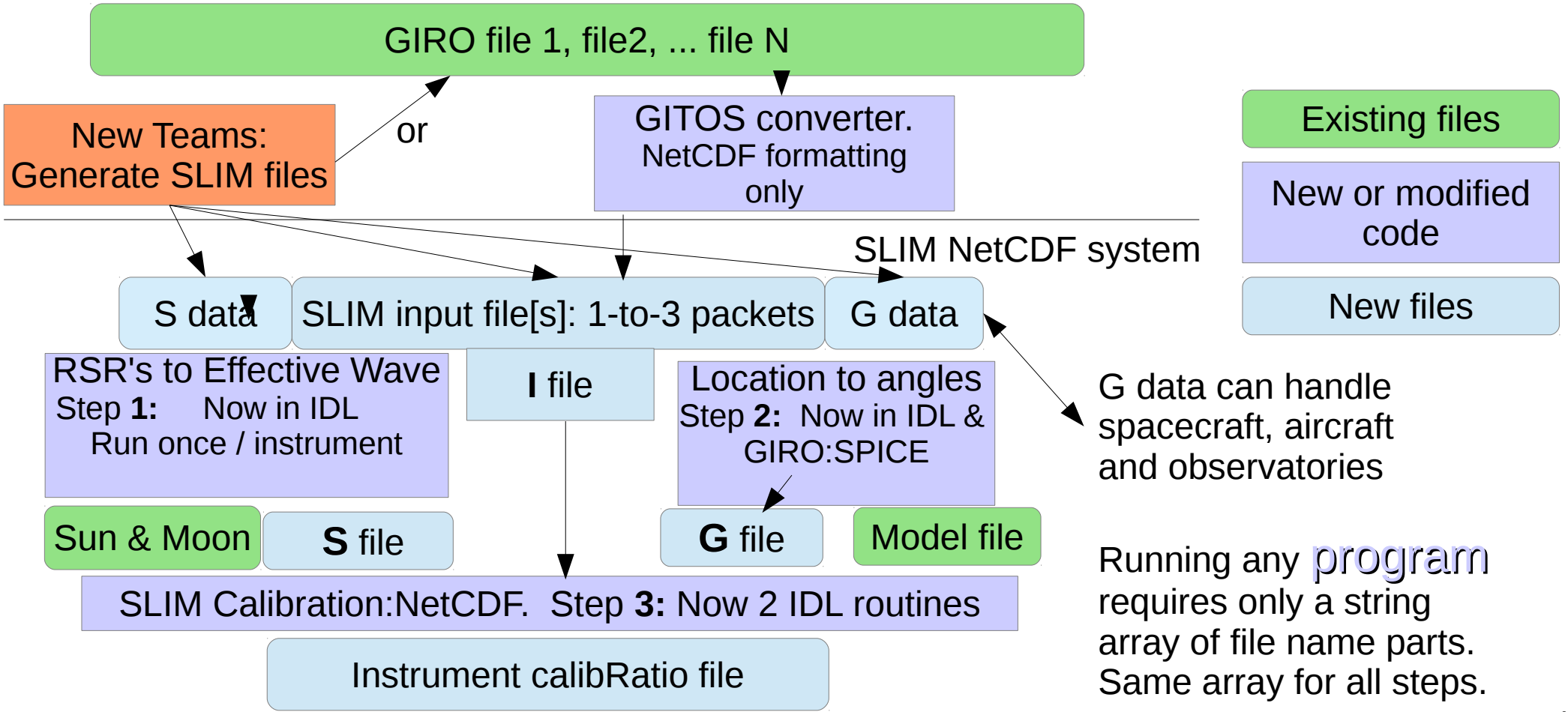
Design principles

- The instrument information needed to do lunar calibration has ***different permanence*.**
- Spectral: **S** Band spectral response commonly stable over the life of a mission. Can also include **S**table information about the spacecraft, instrument, institution and instrument team.
- Geometry: **G** (time and location) Usually static soon after each observation.
- Irradiance: **I** May be computed multiple times as image processing procedures improve.

Multiple Goals. However: restrict to irradiance calibration

- Allow calibration to be run at any institution.
- Minimize the instrument team effort required.
- Accommodate observatories and aricraft, as well as spacecraft
- Keep file sizes small enough for email transfer between institutions.
- Omit everything related to imagettes
- Optionally allow separation of information based on its permanence.
- Build a GIRO-to-SLIM converter (Tom Stone suggestion).
- One routine should work for all teams.
- I have a draft document that describes all this.
- Everything open to discussion

Flow: SLIM in NetCDF



Coding Task. Which organization can do this ?

- GITOS: Reformatting NetCDF files, attributes and variables. Few calculations.
- 1: RSR's to Effective-Wavelength: [_wt to _ev]
- Existing IDL code in SLIM. May exist somewhere in the GIRO system.
- Requires two functions:
- 1) Interpolation of the RSR's onto the uniform proportional resolution system: λ/Δλ=1000.
- 2) Spectral multiplies to form effective wavelength and in-band nominal lunar irradiance.
- 2: Time+location to angles & distance. Requires JPL ephemeris [_tv to _pg]
- a) Use the JPL ephemeris directly. Current SLIM IDL + FORTRAN.
- or b) Use the JPL SPICE software system. Current GIRO ? Current SLIM IDL .
- 3: Calibration
- Uses NetCDF **S, I, G** files: IDL slimcal_nc.pro. 230 lines, all but about 40 are file handling.
- One IDL subroutine (generic basis function generator): sid2bij.pro 82 lines.