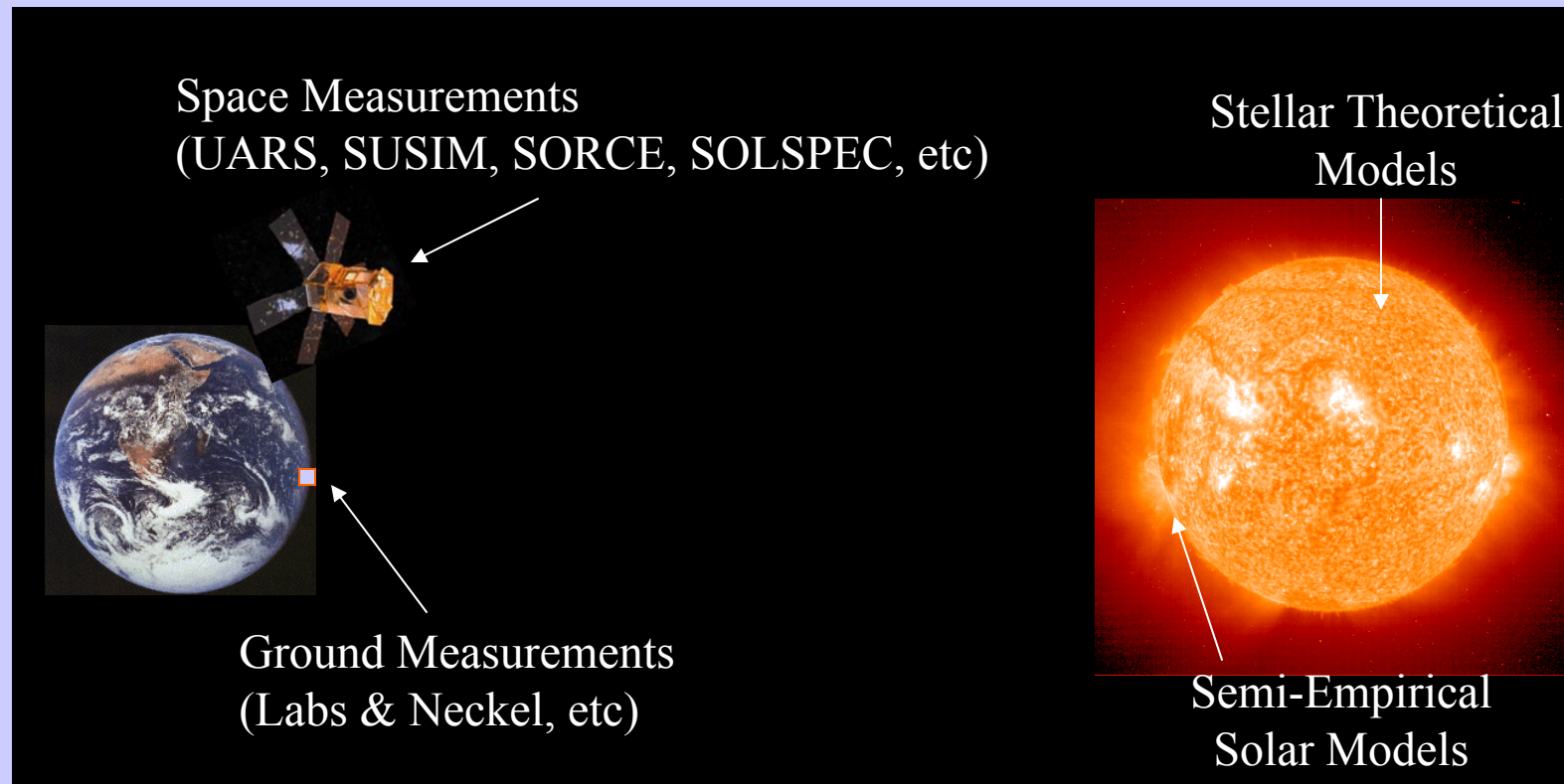


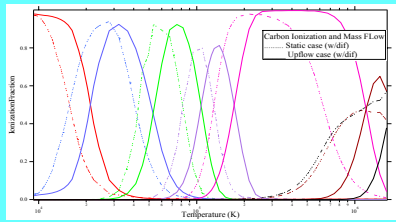
# Spectral Solar Irradiance Sources



**/----- *Solar Radiation Physical Modeling (SRPM)* -----/**

**Seeks not to replace these, but rather to integrate them  
in a consistent physical model that matches the observations.**

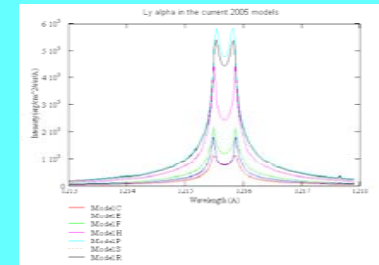
# SRPM Flow Scheme



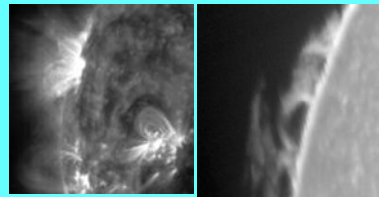
$n_{lev}, n_{ion}, \dots(x, y, z, t)$

Intermediate  
Parameters

Emitted  
Spectrum

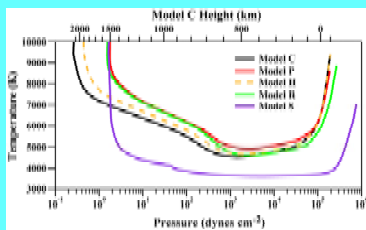


$I(\lambda, \mu, \phi, t)$

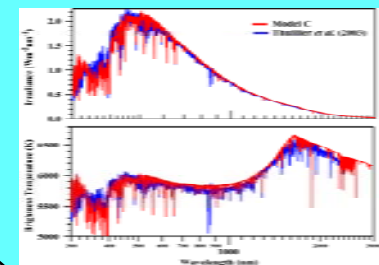


Physical Models  
& Processes

Observed  
Spectrum

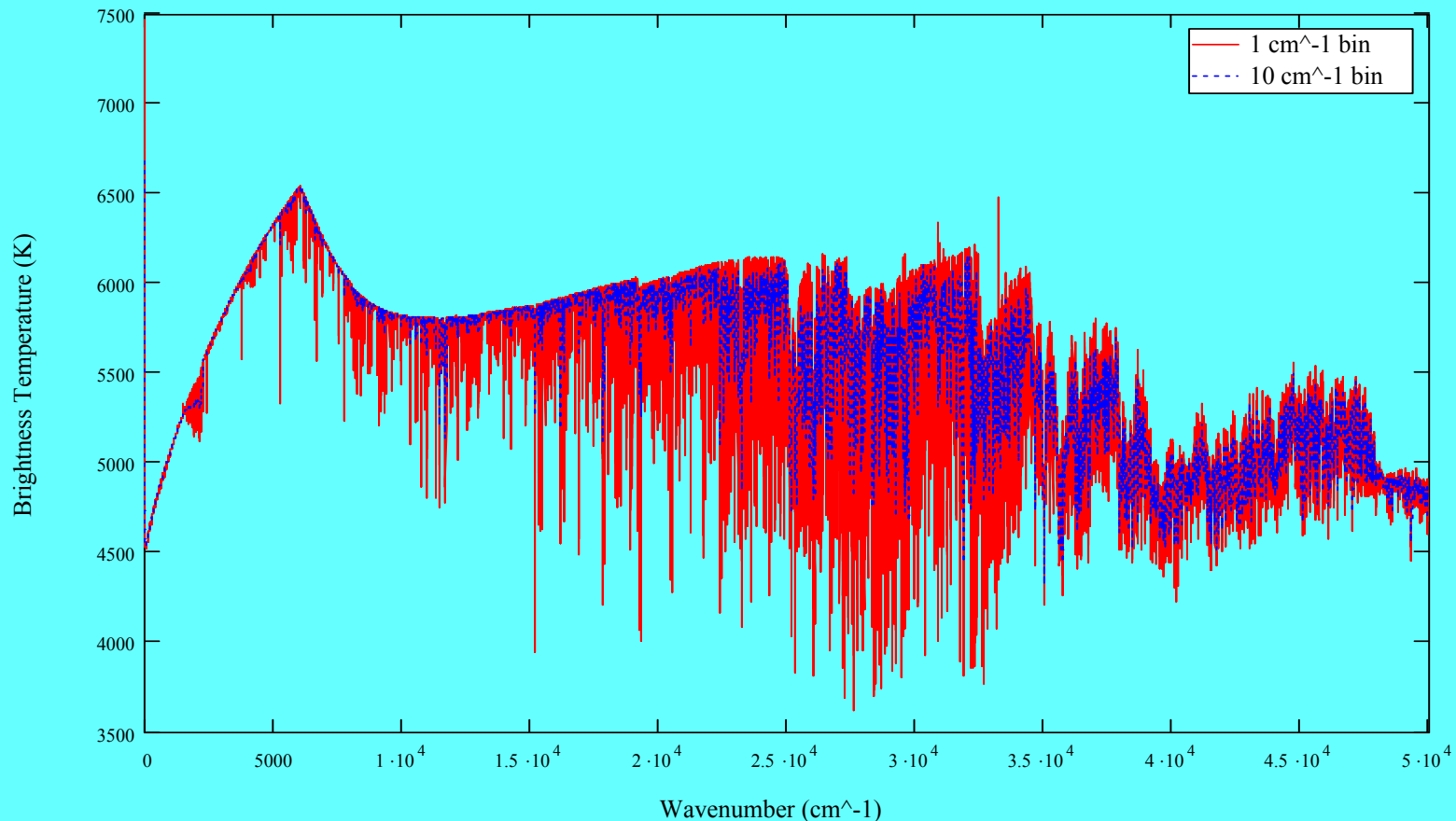


$T, n_e, n_h, U, \dots(x, y, z, t)$



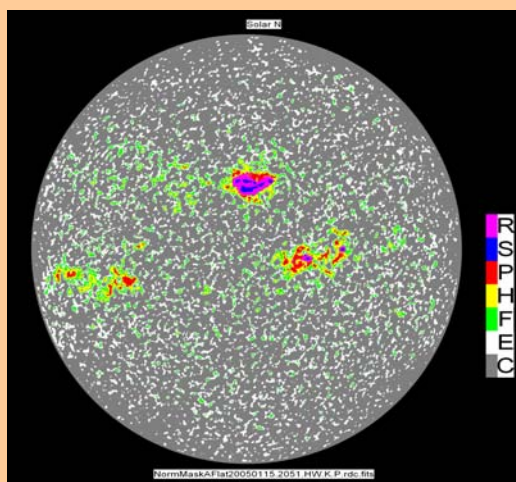
$I(\lambda, \mu, \phi, t)$  <sup>2</sup>

# New Reference Spectrum (Quiet Sun)

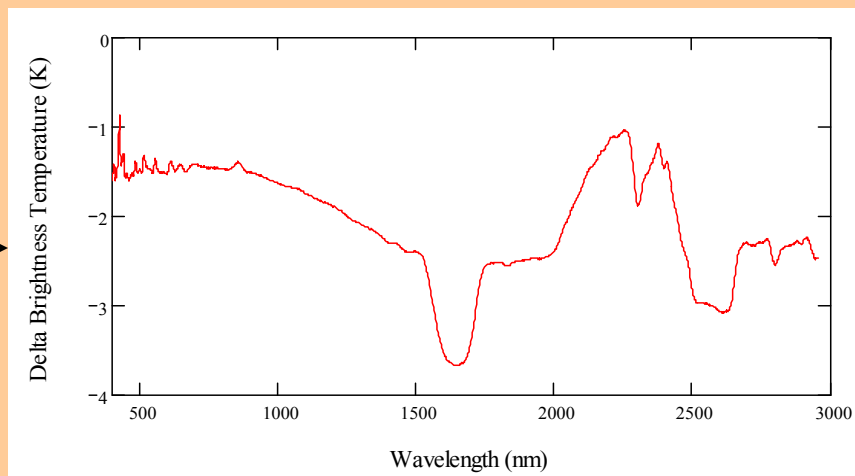


- Option in MODTRAN at 0.01 to 10 cm<sup>-1</sup> bins
- On AER web site at full resolution

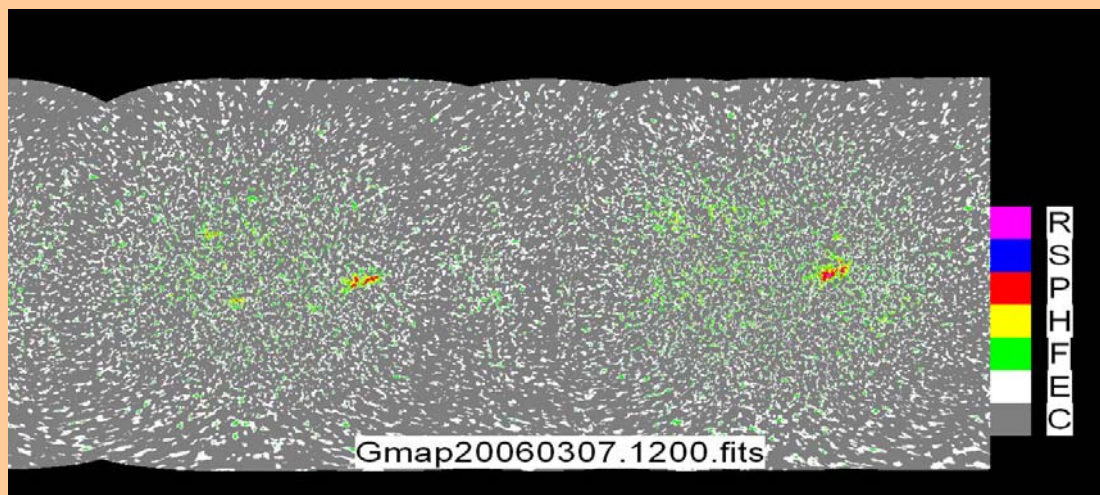
# Irradiance & Features on the Sun



Daily solar disk mask



Brightness temperature daily variation



Synoptic mask of the whole Sun



Ly $\alpha$  flux  
around the Sun 4

# Next Steps

- **Improve visible & IR continuum:**
  - Tune the model photospheres to fix the 3% excess
  - Keep updating the atomic data with NIST V3.0
  - Extend non-LTE to more species (e.g. Mg, Fe )
- **Extend SRPM to the UV:**
  - Develop better model chromospheres
  - Non-LTE for all species
- **Extend SRPM to the EUV and XUV:**
  - Develop model corona and transition region
  - Consider more ionization stages

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