Global comparisons of IASI radiance simulations with LBLRTM, RTTOV, the Havemann-Taylor Fast Radiative Transfer Code (HT-FRTC) and its monochromatic version
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1. Potential sources of differences between models (for the comparisons the assumptions are identical across models, i.e. 17 RTTOV gases, 0.001 cm⁻¹, 91 levels)

   a. All HITRAN gases (48) versus RTTOV selection (17)

   b. Spectral resolution of 0.01 cm⁻¹ versus 0.001 cm⁻¹

   c. Vertical resolution of the atmospheric profiles

2. HT-FRTC - LBLRTM
   (100 random independent profiles)

3. RTTOV - LBLRTM
   (same 100 profiles)

4. HT-FRTC - RTTOV
   (24000 random independent profiles)

5. Jacobians around 950 cm⁻¹

   - HT-FRTC uses very high resolution, line-by-line, sensor-independent principal components (PC)
   - covers spectrum from microwave to UV
   - 50 trace gases, 20 aerosols, clouds and precip
   - spectrally resolved surface emissivity / reflectivity
   - airborne, spaceborne and ground-based sensors
   - solar and lunar contribution, spherical Earth
   - part of 1D-Var retrieval in PC space