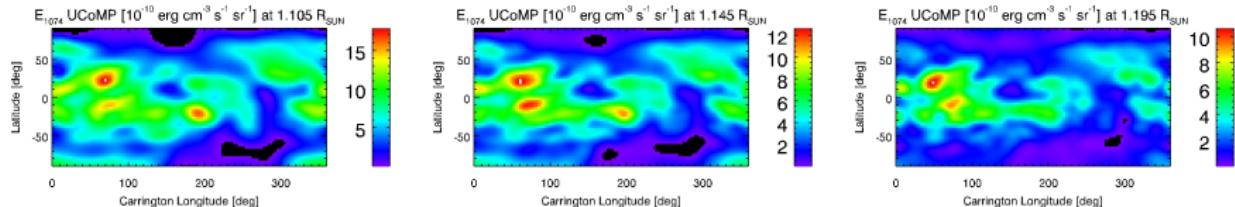


# Tomography: UCoMP versus AIA versus KCOR

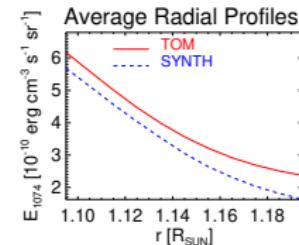
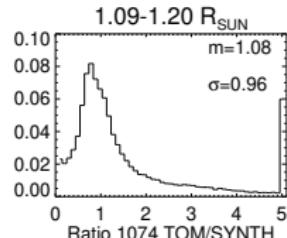
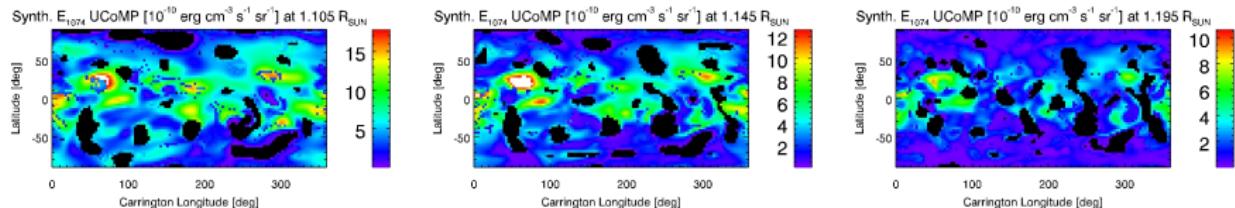
- **Solar rotational tomography (SRT)** makes use of 1/2 solar rotation (14-day) long sequences of coronal images to determine the **3D distribution of various physical quantities** of the corona, depending on the observed wavelength range.
- Using **WL pB** images (e.g. KCOR, C2, Metis), SRT allows determination of the **3D  $N_e$** .
- Using **EUV** images with a given filter (e.g. AIA 171 Å), SRT allows determination of the **3D band-emissivity**. Based on the reconstructed band-emissivity for various filters independently (e.g. AIA 171, 193, and 211 Å), a local-DEM analysis can be carried out at each location of the corona to determine the **3D  $N_e$**  and  **$T_e$** . The combined procedure is known as DEM-Tomography, or **DEMT**.
- Using **UCoMP** total-line (wavelength-integrated) images, SRT allows determination of the **3D line emissivity**.
- For a specific period (September 2022), we carried out:
  - a) **UCoMP-SRT** with 1074 and 1079 nm images to determine their respective **3D emissivity maps**. The 1074:1079 emissivity-ratio can then be used to determine 3D  $N_e$ .
  - b) **AIA-DEMT** (using filters 171, 193 and 211 Å) to determine the **3D  $N_e$**  and  **$T_e$** , in turn used with CHIANTI to compute **3D synthetic emissivity maps** for the lines at 1074 and 1079 nm.
  - c) **KCOR-SRT** to determine the 3D distribution of  $N_e$ .
- These instruments allow reconstructions over a common range of heights  $1.1 - 1.2 R_\odot$ . We compare:
  - 1) The tomographic UCoMP-SRT line emissivities against the synthetic prediction based on AIA-DEMT.
  - 2) The 3D  $N_e$  derived from UCoMP-SRT, derived from AIA-DEMT, and derived from KCOR-SRT.

# 3D Coronal Emissivity at 1074 nm

Lat/Lon maps of UCoMP 3D **Tomographic** 1074-Emissivity

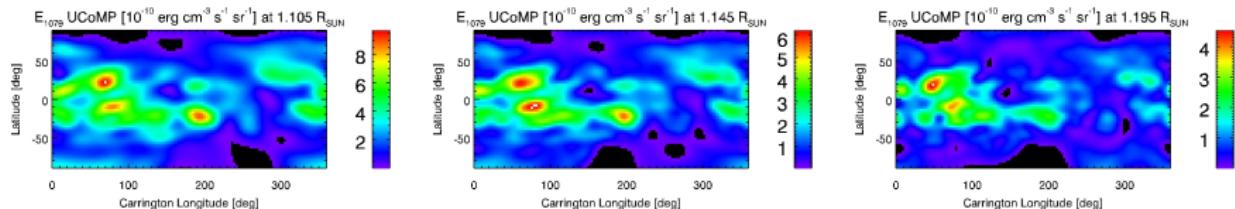


Lat/Lon maps of AIA(171-193-211)-DEMT 3D **Synthetic** 1074-Emissivity

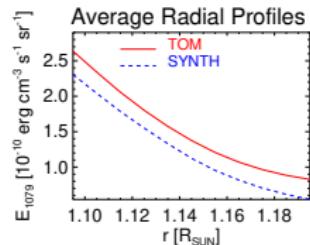
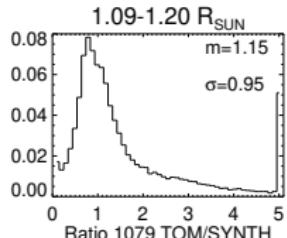
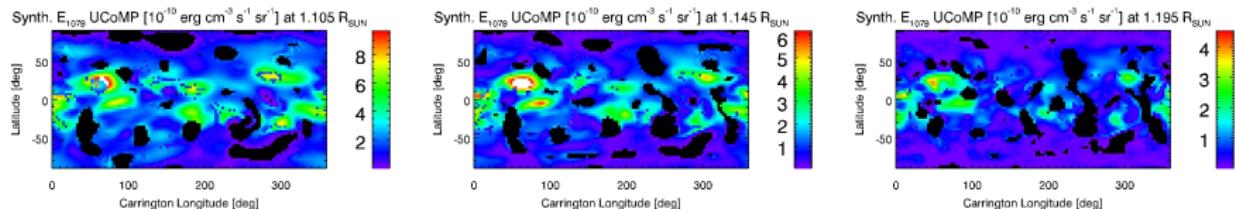


# 3D Coronal Emissivity at 1079 nm

Lat/Lon maps of UCoMP 3D **Tomographic** 1079-Emissivity

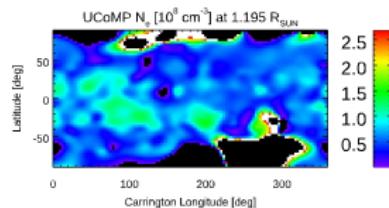
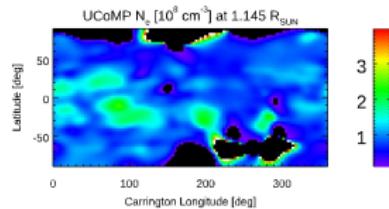
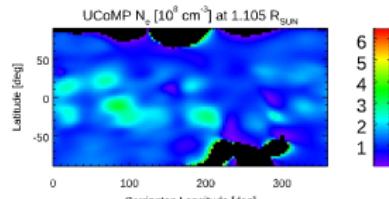


Lat/Lon maps of AIA(171-193-211)-DEMT 3D **Synthetic** 1079-Emissivity

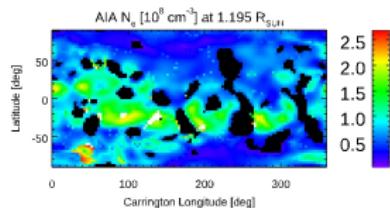
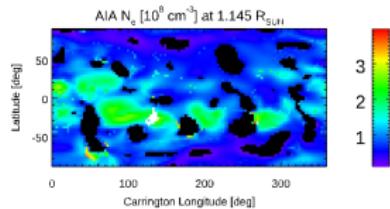
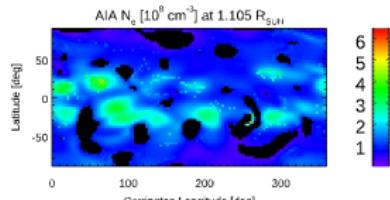


# 3D $N_e$ with Three Diagnostics

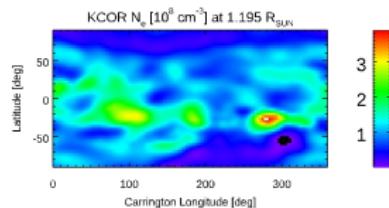
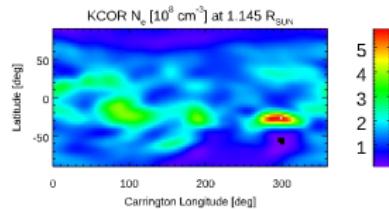
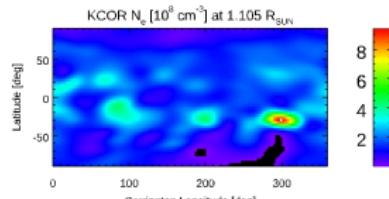
UCoMP-SRT



AIA-DEMT

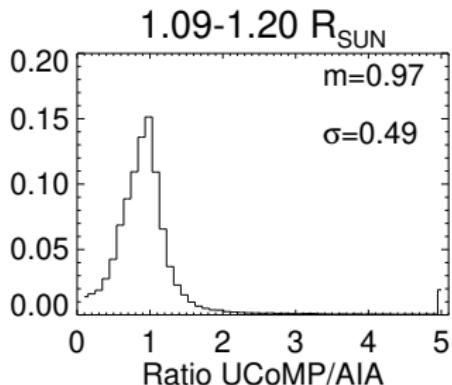


KCOR-SRT

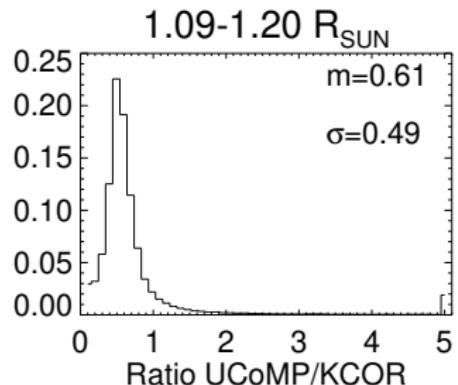


# Comparison of Reconstructed $N_e$

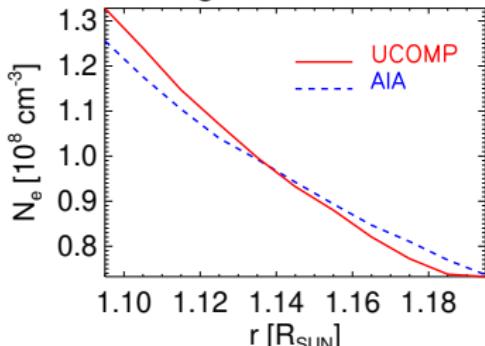
UCoMP versus AIA



UCoMP versus KCOR



Average Radial Profiles



Average Radial Profiles

