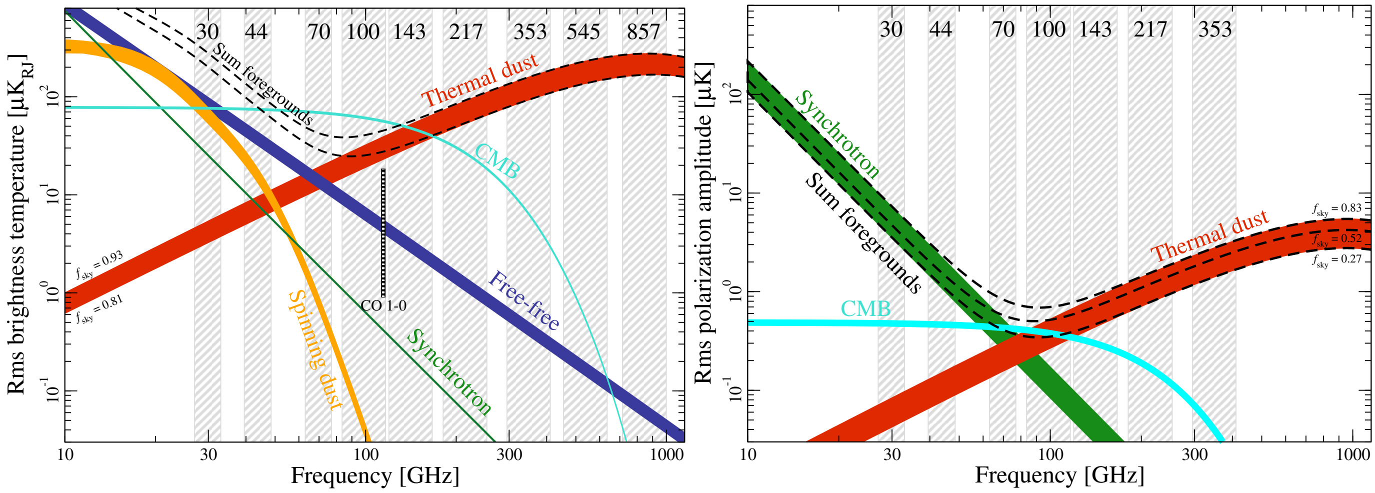

Fig. 4. Frequency dependence of the main components of the submillimetre sky in temperature (left) and polarization (right). The (vertical) grey bands show the *Planck* channels, with the coloured bands indicating the major signal and foreground components. For temperature the components are smoothed to 1° and the widths of the bands show the range for masks with 81–93 % sky coverage. For polarization the smoothing is 40′ and the range is 73–93 %. Note that for steep spectra, the *rms* shown here is dominated by the largest angular scales. But as shown by Fig. 5, on much smaller angular scales in regions far form the Galactic plane, the foreground signals fall far below the cosmological signal (except at the lowest ℓ, in polarization).

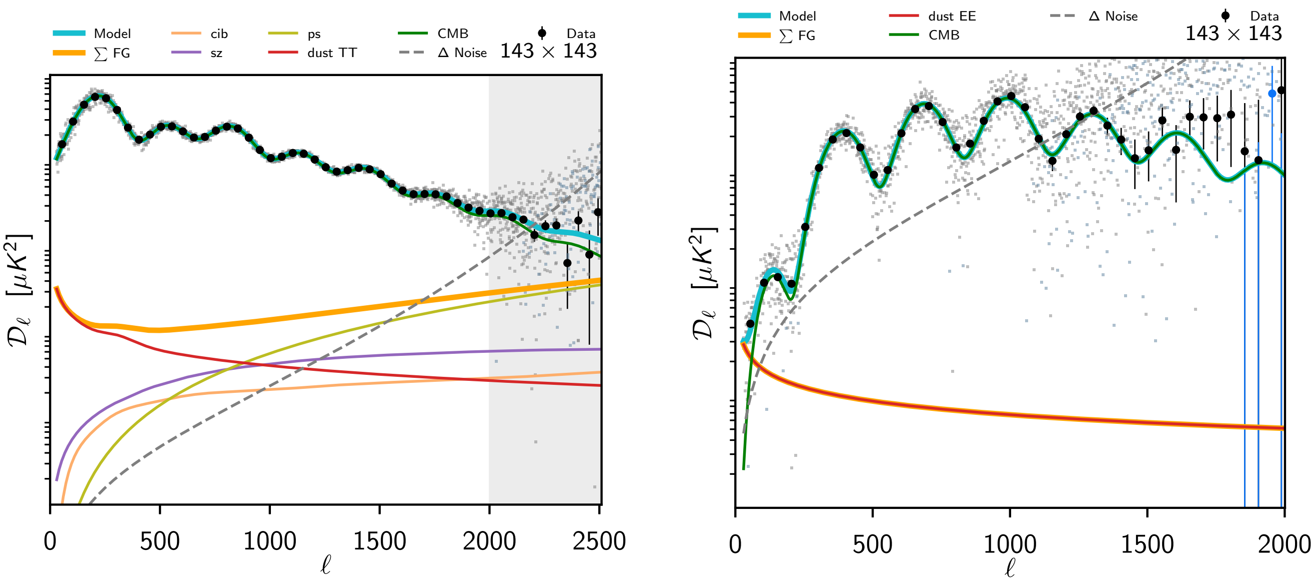

Fig. 5. Angular scale dependence of the main components of the submillimetre sky at 143 GHz in temperature (left) and E-type polarization (right). These power spectra, $\mathcal{D}_\ell = \ell(\ell+1)\,C_\ell/(2\pi)$, give approximately the contribution per logarithmic interval to the variance of the sky fluctuations. They are computed within the sky regions retained for the cosmological analysis (57 % of the 143 GHz sky for the temperature and 50 % for polarization, in order to mask the resolved point sources and decrease the Galactic contributions). The grey dots are the values at individual multipoles, and the large black circles with error bars give their averages and dispersions in bands. The data (corrected for systematic effects) are very well fit by a model (cyan curves) that is largely dominated by the CMB fluctuation spectra (light blue curves, mostly inside the model), with a superposition of foreground emission (orange curves) dominated by dust at large scales (red curve), together with a noise contribution (dotted line). Note, however, that foreground emission actually dominates the "reionization bump" at the lowest polarization multipoles. The grey shaded area shows the area in temperature which is not used for cosmology.

ponent maps is described in Planck Collaboration IX (2016). At low frequencies (below 50 GHz) the total intensity is dominated by free-free (bremsstrahlung from electron-ion collisions), synchrotron, and spinning dust emission, while polarization is dominated by synchrotron emission from relativistic cosmic ray electrons spiralling in the Galactic magnetic field (e.g., Planck Collaboration XXV 2016). At higher frequencies (above 100 GHz) the total intensity is dominated by thermal dust emission from our Galaxy (extending to high Galactic latitudes and sometimes referred to as "cirrus") at low ℓ and the cosmic infrared background (CIB; primarily unresolved, dusty star-forming galaxies) at high ℓ (Planck Collaboration XXX 2014).