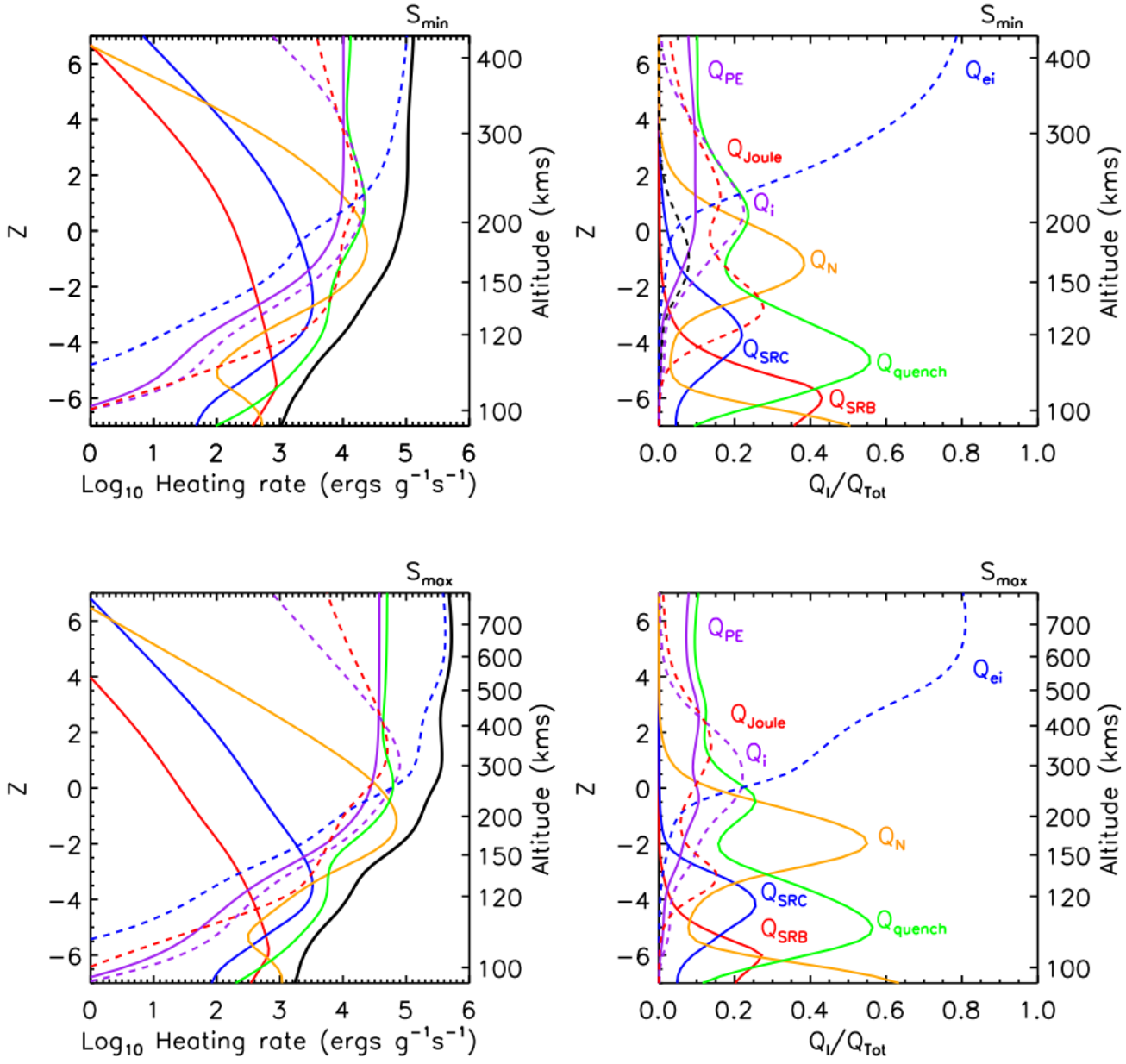

Figure 5.2: ACE1D model calculations of neutral gas heating rates for solar minimum ($P = 70$) (top) and solar maximum ($P = 250$) (bottom). On the left column are the magnitudes of the heating rates and on the right column are the fractional contribution of each process. Shown are the total heating rate (black), heating due to absorption in the Schumann Runge bands (Q_{SRB}, red) and Schumann Runge continuum (Q_{SRC}, blue), direct heating due to thermal collisions with photoelectrons (Q_{PE}, purple), exothermic reactions of neutral species (Q_N, orange), quenching of excited species (Q_{quench}, green), exothermic ion recombination and ion-neutral reactions (Q_i, purple dashed), joule heating (Q_{Joule}, red dashed) and thermal collisions of neutrals with ions and electrons (Q_{ei}, blue dashed).

Venkataramani and Bailey [2020]