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Net radiative cooling rates in cool coronal condensations

We present comprehensive tables of Net Radiative Cooling Rates (NRCR) in cool solar plasma with prominence-like properties. These NRCR are based on the 1D non-LTE radiative transfer modelling of prominences in the transitions of 5-level plus continuum hydrogen, Mg II and Ca II ions. These atomic transitions are the dominant contributors to the radiative energy budget of prominence-like plasmas.

The derived NRCR describe the balance between the radiative losses from the plasma in all considered transitions and the radiative gains in the form of incident radiation illuminating the prominence plasma from the solar disk. In other words, NRCR represent an energy sink/source caused by the dominant radiative processes (both optically thick and thin) in the prominence-like plasma illuminated from the solar surface. As such, the NRCR values can be used in conjunction with other energy source or sink terms in studies of energy balance or transport in the cool coronal condensations - for example, in the evaporation-condensation processes forming the cool plasma, or studies of waves and oscillations in such plasma.

The provided NRCR are tabulated for different values of temperature and gas pressure, and also for different distances of the considered unit volume (voxel) of plasma from the illuminated surface.

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