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Solar Coronal Heating By Plasma Waves BENGT ELIASSON, Umea University, ROBERT BINGHAM, Rutherford Appleton Laboratory, PADMA SHUKLA, University of Bochum, LENNART STENFLO, Umea University — The solar coronal plasma is maintained at temperatures of millions of degrees, much hotter than the photosphere which is at a temperature of just 6000K. In this paper, the plasma particle heating based on the kinetic theory of wave-particle interactions involving the kinetic Alfven waves and lower-hybrid drift modes are presented. The solar coronal plasma is collisionless, and therefore the heating must rely on turbulent wave heating models, such as lower-hybrid drift models at reconnection sites or the kinetic Alfven waves. These turbulent wave modes are created by a variety of instabilities driven from below. The transition region at altitudes of about 2000 km is an important boundary chromosphere, since it separates the collision dominated photosphere/chromosphere and the collisionless corona. The collisionless plasma of the corona is ideal for supporting kinetic wave-plasma interactions. Wave-particle interactions lead to anisotropic non-maxwellian plasma distribution functions, which may be investigated by using spectral analysis procedures being developed at the present time.

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