

SOME EFFECTS OF STRONG ACOUSTIC WAVES ON STRONG SPECTRAL LINES

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Abstract

We have studied the formation of optically thick lines in time dependent, non-linear hydrodynamic model of the solar chromosphere. Models of the 200 second, chromospheric oscillation indicate that the emission peaks of self-reversed profiles such as those of Mg II and Ca II are formed at very different depths depending on the phase of the oscillation, while the central absorption feature is emitted at a very nearly constant mass depth. The figure shows the Mg II k line emitted by the mean atmosphere, including "microturbulence" (triangles) and the mean profile (squares). In addition to the substantial intensity increase interior to the emission peaks, one should note that the peaks are broadened only towards line center; i.e. the intensity fluctuations are symmetric outside of the peaks and strengthen more than they weaken within the peaks. A more detailed version has been submitted to the Astrophysical Journal.

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