

shift in ionization with effective temperature, two other stars were measured, one slightly hotter than α Boo (β Gem K0III) and one slightly cooler (β Umi K4IV). The preliminary results seem to confirm the effective temperature dependence since no asymmetries were found for β Gem and stronger blue-shifted core asymmetries were found for β Umi.

SMALL-SCALE VERSUS LARGE SCALE MOTIONS IN THE SOLAR ATMOSPHERE DERIVED FROM
A NON-LTE CALCULATION OF MULTIPLY 38 OF Ti I

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Abstract

A non-LTE computation of multiplet 38 of Ti I (11 lines) has been undertaken in order to determine small and large scale unresolved motions contributing to the Doppler broadening of solar lines at the centre of the disk (vertical motions) and at the edge of the disk (horizontal motions).

The abundance of Titanium and the total Doppler velocity (all scales) are determined by fitting observed and computed profiles of weak unsaturated lines ($W < 12 \text{ m}\text{\AA}$) of the multiplet. Then saturated lines having the same lower level as the weak lines are computed for a variety of partitions of the total kinetic energy between the small scale and the large scale modes going from 0% small scale to 100% small scale. Oscillator strengths with internal accuracies of about 2% from Wahling (1977) have been used. The location of the observed profile (taken from Delbouille et al. for the centre of the disk and from Brault and Testerman, KPNO for $\mu = 0.2$) among the computed profiles yields the partition of the energy between the two modes.

The computations done so far with 4 levels and continuum give less than 20% of the energy in the small scale mode. Further computations with more levels are needed to establish this ratio with better accuracy. The total energy for vertical motions has a root square velocity of about 1.4 km/sec whereas the same quantity is 2.2 km/sec for horizontal motions.