

THE HEIGHT DEPENDENCE OF GRANULAR MOTION

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Abstract

Spectrograms of Mg I-absorptions lines have been registered at different positions of the damping wings. The corresponding heights within the atmosphere have been approximated by the Eddington-Barbier approximation. We calculated the coherence between the intensity fluctuations in the continuum and those of the higher layers. We found a rather flat gradient up to a height of 100 km and above this a steep decrease of coherence. From this result we can conclude that above a height of 100 km any fluctuations of intensity are not due to ordinary convective processes. However, up to a height of 400 km we found a coherence between the velocity of granulation and its intensity fluctuations.

NUMERICAL SIMULATIONS OF THE SOLAR GRANULATION

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Abstract

Numerical simulations of the convective granular motions in the solar photosphere are presented. Realistic background physics allows a detailed comparison with observed characteristics of the solar granulation. The numerical methods are based on a bivariate Fourier representation in the horizontal plane, combined with a cubic spline representation in the vertical direction. Using a numerical grid with 16x16x16 grid points, which cover a unit cell of dimension $\approx 3600 \times 3600 \times 1500$ km, granular motions have been followed over several turnover times. The simulated motion shows the characteristics of granular motion. The evolution of large granules into bright rings ("Exploding granules") is a consequence of the accumulating excess pressure at the granule center, necessary to support the horizontal velocities required by the contin-