

# Chromospheric Dynamics

Siraj S. Hasan

Indian Institute of Astrophysics, Koramangala, Bangalore, India

This review focuses on dynamics of the solar chromosphere, which serves as a good proxy for understanding processes in stellar chromospheres. In the quiet chromosphere we distinguish between the magnetic network on the boundary of supergranulation cells, where strong magnetic fields are organized in mainly vertical magnetic flux tubes, and internetwork regions in the cell interior, where magnetic fields are weak and dynamically unimportant.

Observations have firmly established the presence of oscillations in the solar chromosphere. Both the network and internetwork media show bright points (BPs), which are prominent in the emission peaks in the cores of the Ca II H and K lines. However, the dynamical and spectral properties of network and internetwork BPs are quite different. In the latter the chromospheric velocity power spectrum is dominated by oscillations having power in the 5-7 mHz range, which can essentially be regarded as acoustic waves, whereas the network exhibits low-frequency oscillations with periods 7-20 min. The qualitative properties of internetwork BPs are reasonably well understood, including their formation in upward propagating acoustic shocks that encounter downward-flowing gas. On the other hand, the physical processes that heat the magnetic network have not been fully identified. Are network BPs heated by wave dissipation and if so, what is the nature of these waves? These and other aspects relating to the dynamics and energy transport mechanisms will be discussed in detail. Furthermore, a critical assessment will be made on the challenges facing theory and the direction for future investigations, particularly in the light of the new space experiments, will be highlighted.