PREFACE

The devotion of an IAU symposium entirely to the topic of chromospheric fine structure at a time when models of the spherically symmetric chromosphere are still evolving constitutes a valid recognition of the growing feeling among solar astronomers that the chromosphere cannot be understood independently of its discrete structural features. Network structure, which seemingly borders the photospheric supergranule cells, persists intact throughout the chromosphere and most of the chromosphere-corona transition region. The network is the locus of the bright coarse mottles, and the spicule bushes and is the terminus for one end of the quiet chromospheric fibrils as well. Additionally, it is the locus of most of the magnetic flux of the quiet chromosphere. It is not surprising, therefore, that current studies of the chromosphere tend to center around efforts to better describe the network phenomena and to ascertain the physical properties of the network features. Clearly, the supergranule cells and associated network structures constitute a fundamental and singularly important feature of solar structure in the boundary layers.

Just as it is now clear that much of the chromospheric fine structure is associated with the network bordering supergranule cells, it seems equally clear that structural features are almost universally associated with both fluid flow and magnetic geometry. Indeed, many observers claim that the brightness features faithfully map the magnetic lines of force while still others claim that associated with each class of brightness feature there is a more or less unique fluid flow.

Fluid streaming and wave phenomena associated with fine scale features of the solar atmosphere represent the transport of non-radiative energy that, in turn, heats the chromosphere and corona. Most of what astronomers now casually classify as 'micro-' and 'macro-turbulence' undoubtedly arises from these combined streaming and wave motions. Thus, an understanding of the fluid motions associated with chromospheric fine structure appears to be fundamental to both the interpretations of line broadening and mechanical energy transport in the Sun. Similarly, the concentration of magnetic flux in the network and the strong correlation between regions of enhanced magnetic flux, increased chromospheric brightness (in all spectral regions) and increased flow speeds suggest that the magnetic field is in some way important to the very existence of the chromosphere and corona.

Chromospheres undoubtedly exist in the majority of stars; and by implication, chromospheric fine structure exists in the majority of stars as well. Only in the case of the Sun, however, can we hope to isolate and identify the true nature of the fluid motions giving rise to spectral line broadening and to the transport and dissipation of mechanical energy.

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