for the isobaric mode by linearizing the hydrodynamic equations. We find that there are three mechanisms which affect the stability: the derivative of the radiative energy loss term with temperature; thermal conductivity which is stabilizing even in the case of uniform temperature; and the gradient of heat flux which comes from non-uniform heat conductivity along the loop. Stability is tested for several model equilibrium loops and the results are compared with two different methods, eigen-value calculations and dynamic calculations in which the coupling of radiative transfer with hydrodynamic effects is self-consistently treated. We find that the simple sufficient stability condition agrees well with the two other methods above the transition region where the coupling between radiative transfer and hydrodynamic effects is weak. We will also present a stable equilibrium loop model and discuss the stabilizing mechanisms of loops in detail.

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Q.2 Models for Stellar Flares Based on the Physics of Solar Flares, L. E. CRAM, Sacramento Peak Observatory, and D. T. WOODS, U. Colorado and Sacramento Peak Observatory - Semi-empirical non-LTE models of the chromospheric parts of solar flares show that the visible and UV flare radiation can be explained in terms of increased transition zone pressures, and deep-lying photosphere-chromosphere temperature minima. We have constructed models for stellar flares based on analogous changes in atmospheric structure. These changes can produce very strong Balmer emission lines with only modest half-widths, and a significant increase in the visible and UV continuum flux due to both chromospheric (optically thin) and photospheric (optically thick) radiation. A model based on a Teff = 3500K, log g = 4.75 photosphere with a transition zone base pressure of 70 dynes cm⁻² produces Balmer lines with equivalent widths ratios Hα : Hβ : Hγ : Hδ = 27 : 27 : 33 (Å) and FWHM widths 2.5 : 1.0 : 0.7 (Å), which are not unlike values observed in stellar flares.

Q.4 THE ROLE OF BETATRON ACCELERATION IN COMPLEX SOLAR BURSTS, J.T. Erpen*, NRL - The betatron-acceleration process was proposed by Brown and Hony (1975) as a means of producing the continuous, quasiperiodic electron acceleration which may occur in long-lasting hard X-ray events. We have investigated two pertinent facets of the betatron model: the possibility that the multiplicity characteristic of complex impulsive bursts is due to the betatron process; and the possibility that some or all of the second-stage emission during two-stage bursts can be attributed to betatron acceleration. To test for the pattern of X-ray spectral behaviour predicted by the betatron model, 18 multiply-impulsive events and 14 two-stage bursts were selected from the OSU-5 hard X-ray spectrometer data for in-depth analysis. The purely impulsive emissions show no signs of the effects of betatron action, thus eliminating this process as a potential source of impulsive-phase multiplicity. However, the spectral characteristics determined during the first few minutes of the second stage are found to be consistent with the predictions of the betatron model for the majority of the two-stage events studied. The betatron-acceleration mechanism thus has been identified as a common second-stage phenomenon, closely associated with the diverse phenomena at other wavelengths which accompany this phase of emission. The physical significance of the source parameters derived according to the model-fitting procedure are discussed in detail, and the role of the betatron process is evaluated in the broader context of present-day concepts of the second stage.

*NAS/NRL Research Associate.


Q.5 OBSERVATIONAL SEARCH FOR VARIATIONS IN THE SOLAR CONVECTION, B. J. Labonte and R. Howard, Mount Wilson and Las Campanas Observatories.