13.3 A Model of Spicules and Surges, P.A. Sturrock & M. J. Blake, Stanford University. Based on the morphological and other similarities between spicules and surges, we take the position that spicules, macro-spicules and surges are produced by the same physical process. Although spicules and surges give the appearance of being channeled along magnetic-field lines, we have found from earlier studies that it is difficult to reproduce their properties by a model in which gas is driven along a magnetic flux tube either by gas pressure or by a combination of gas and magnetic pressure. We have therefore re-examined the Pikel'ner model, according to which gas is transported in a sequence of "magnetic hammocks" which may form as a result of reconnection or as the result of anomalously rapid slippage of magnetic field lines through the upper photosphere. We find that it is possible to reproduce the kinematic properties of spicules and surges by this mechanism. However, in its original form, one would expect the gas to disperse rather than remain coherent, so that the mechanism appears to provide a better explanation of flare sprays than of spicules or surges. On examining a high-resolution photograph of a surge taken at Sacramento Peak Observatory, we conclude that the magnetic-field configuration in that case involves two distinct regimes: one provides the driving force as in the Pikel'ner model, the other provides a guiding "rail" which accounts for the appearance that flow is being channeled along magnetic-field lines.

This work was supported in part by NASA MAGW-92, NGL-05-020-272, and ONR N00014-75-C-0673.

13.5 A New Measurement of the Facular Contrast Near the Solar Limb*, R. G. Libbrecht and J. R. Kuhn, Princeton Univ. A new measurement of the contrast of solar faculae at 525 nm and 800 nm is presented using data taken during the summer of 1982. We find that the contrast, defined as ΔI/I = (Ifac - Ihot)/Ihot, is decreasing toward the limb from μ ≤ 0.2 to μ ≥ 0.08, where μ = cos θ and θ is the heliocentric angle. Parameterizing the contrast function with ΔI/I = 0.2 + a(μ - 0.2) we obtain the best fit values of a = 0.33 ± 0.14, aμ = 0.25 ± 0.08. Comparison with other measurements and with facular models is discussed.

*This research was supported in part by the National Science Foundation.

13.6 Two-Dimensional Photometry of Active Region BBSO No. 18511, G.A. Chapman, A.D. Heidger, J.K. Lawrence, S.H. Colman, and J.C. Shelton, Torino. This active region is the return of no. 18474 which crossed the west limb on 21 July 1982. Preliminary photometry on that region was reported in January 1983 at Boston. We report preliminary reduction of photometry of this region on its return at the east limb, 3-6 August 1982. We present results in the form of monochromatic (λ = 0.63 μm) brightness changes of the whole sun, assuming no other effects to be present. As the active region rotates onto the disk, the intensity balance goes from positive to negative. The preliminary values found, for 18511 are +55, -326, and -585 on 3, 5, and 6 August 1982, respectively. The excess of deficit in brightness is in parts per million of the quiet solar disk. These data will be compared with photometry from July and with photographic area measurements. This work was sponsored, in part, by NSF grant no. AST-8121863.

FRIDAY
Session 14: Instrumentation, Active Regions, and Velocity Fields
0830-1700 (Mirror Room)
(Display Presentation)

A new active optical system has been developed for solar observations. It has been tested at the vacuum tower telescope at Sacramento Peak, and has shown itself to be capable of significantly improving seeing, even under extremely bad seeing conditions. The system shows great promise for both high resolution observations and for extending available times for lower resolution work. For example, 6 arc second seeing can be improved to 2-3 arc seconds.