Menzel, Donald H. Magneto-hydrostatics and solar prominences.

The hydrodynamic equation of motion for an ionized gas, in the presence of a magnetic field $\mathbf{H}$, is

$$\rho \frac{d\mathbf{v}}{dt} = -\nabla p + \rho \mathbf{F} + \frac{1}{4\pi} (\nabla \times \mathbf{H}) \times \mathbf{H},$$

where ρ is the density, $\mathbf{v}$ the velocity, p the pressure, and $\mathbf{F}$ the external force field. This is the generalized form of the Alfvén equation, one solution of which leads to magneto-hydrodynamic wave motion. One can find other solutions, among them the static case, where the magnetic forces just balance the combined effects of gravitation and pressure gradient. The solutions suggest characteristics of solar prominences. Further extensions of the theory to the case of slow quasiplastic deformation indicates a possible mechanism for the formation of prominence filaments and for the production of regions of high temperature.

I wish to thank Mrs. Martha B. Shapley for help in carrying the final numerical integration of the equations. This work was carried out under an Air Materiel Command Contract.

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Mikesell, A. H., A. A. Hoag and John S. Hall. Quantitative measurements of stellar scintillation.

This study consists of the quantitative observation of the distribution of harmonic components of scintillation with frequency. Examples of preliminary results at frequencies ranging from 10 to 800 cycles per second are used to exhibit changes in this frequency distribution with: visual seeing, zenith distance of the observed object, altitude above sea level, size of circular aperture, and orientation of rectangular aperture. Motion pictures of shadows on a 40-inch mirror caused by atmospheric disturbances which produce the scintillation of starlight indicate that these shadows have a transitory nature. Motion pictures of Hartmann images demonstrate changes of size, shape and brightness (scintillation) of stellar images formed as light from the same star passes through four widely-separated apertures in front of the 40-inch mirror. Color scintillation is demonstrated with tracings on a dual-beam oscillograph. Other tracings show that scintillating starlight is not polarized.

Arrangements are being made for the publication of this material elsewhere.

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Mohler, Orren C. Some recent observations of helium lines in the infra-red solar spectrum.

Equivalent widths of the three lines: 10123.9A, 10830.4A, and 20583.6A, in the solar spectrum have been measured with the McMath-Hulbert Observatory direct-intensity recording spectrograph, using a Cashman *PbS* cell. Changes in equivalent width at different points on the disk of the sun have been observed. The observations indicate that 10123.9A and 20583.6A, are indeed solar, but the same observations make the identification 10123.9 *HeII* and 20583.6 *HeI* doubtful.

The increase in intensity of 10830 (*HeI*) from center to edge of the disk, in faculous areas, and in dark filaments, is confirmed. It is observed that the intensity of this line at the polar limbs is less than at the equatorial limbs. Changes in 10830 in flares, like the variations of 5876 (*HeI*) discovered by Dodson and van Dijke, are established by the new observations. In the high speed dark flocculi that accompany flares, the line can broaden and deepen until it is one of the most conspicuous features of the solar spectrum.

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Naqvi, Ali M. Emission lines of the solar corona.

Two major difficulties in Edlén's¹ tentative identification of the yellow coronal line, $\lambda 5694$, are examined. Suggestions are made for the identifications of the hitherto unidentified coronal lines, $\lambda 4586$ and $\lambda 4567$, according to which these two lines may be associated with the yellow line. Methods of checking the identifications of the three lines observationally are suggested.

According to Edlén, the yellow line arises due to the transition $2p^2 \ ^3P_1 - ^3P_0$ in *Caxv*. The same ion, if present in the corona, should give rise to another line in the observable region due to the transition $^3P_2 - ^3P_1$. Furthermore, the transition probability of $^3P_2 - ^3P_1$ is higher than that of $^3P_1 - ^3P_0$, 130 sec^{-1} compared to 95 sec^{-1} . However, no coronal line has as yet been identified as due to the $^3P_2 - ^3P_1$ transition in *Caxv*. The wave length of the expected line has been calculated by extrapolation along the isoelectronic