ONE HUNDRED-THIRD MEETING OF THE AMERICAN ASTRONOMICAL SOCIETY,
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ABSTRACTS OF PAPERS PRESENTED

Athay, R. Grant. *Anomalous broadening of the CaII K line in spicules.*

Observations of the profiles of the $H\alpha$, $H\beta$, $H\gamma$, D_3 and K lines for polar spicules suggest a spicule model in which the hydrogen, HeI and $CaII$ atoms producing the observed lines are well-mixed, but in which the $CaII$ ions have a non-thermal component of velocity not shared by hydrogen and HeI . An alternative model in which the hydrogen and $CaII$ atoms producing the Balmer lines and the K line are physically separated by temperature stratification from the HeI atoms producing the D_3 line satisfies some aspects of the data and allows hydrogen and $CaII$ to share the same non-thermal velocity field. However, this alternative model is not compatible with the relative intensities of the $H\alpha$ and D_3 lines, nor with the absence of the strong lines of such ions as $SrII$ and $TiII$.

The $H\beta$, $H\gamma$ and D_3 profiles are gaussian, and for the majority of spicules the half-widths for a given line are the same to within the probable errors in the observations. The profiles of these lines indicate a kinetic temperature of $50,000^\circ$ and a non-thermal velocity component of about 7 km/sec. The $H\alpha$ profile is apparently broadened to some extent by self-absorption, which is consistent with the above model. The K line, however, appears to be broadened by a non-thermal velocity component of about 30 km/sec, which corresponds to the mean spicule velocity. It is suggested that the broadening of the K line is due either to the spiralling of the $CaII$ ions about magnetic lines of force oriented at some angle to the spicule motion, or to the forced oscillations of the $CaII$ ions by perturbations in a magnetic field lying in the direction of the spicule motion.

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Bahng, J. D. R., Danielson, J. B., Rogerson, J. B., Jr. and Schwarzschild, M. *Sunspot photographs from the stratosphere.*

The 12-inch telescope used during the balloon flights in 1957 has been modified by adding a

television link so that the astronomer on the ground can see what the telescope is photographing, and by adding a radio command so that the astronomer can focus the telescope and direct it to any place on the solar disk during the flight.

On the first flight this season the television and command links worked satisfactorily but instrumental vibrations and dust on optical surfaces limited the number and usefulness of the high-definition photographs obtained. However, before the next flight both these disturbances were greatly reduced and on the second flight (Aug. 17, 1959) a large number of high quality photographs was obtained.

Time sequences were taken, both of granulation far from sunspots and of sunspots with their immediate surroundings. The time variations of the granules as well as of the penumbral filaments are clearly visible. A highly preliminary inspection of the photographs suggests that the granulation directly adjacent to sunspots does not seem to differ strikingly in size or lifetime from those in undisturbed regions.

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Bakos, Gustav A. *The color-magnitude diagram of visual binaries.*

Photoelectric colors and magnitudes on the B , V system have been obtained for 75 visual binaries. Absolute visual magnitudes have been determined spectrographically for all the primary stars. This and the known apparent magnitude difference between the components fixed the absolute visual magnitude of the companion.

Because of the selection factor the primary components of visual binaries are generally late type stars, giants or supergiants. The secondary components, with a few exceptions, are concentrated along the main sequence. This main sequence deviates slightly from the zero-age main sequence.

When visual binaries are considered in the