

## ABSTRACT

TITLE: DIGITIZING SOLAR ACTIVITY FROM DIRECT IMAGES OF THE SUN.

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The sun's activity has been photographed in the near ultraviolet of CaII, in the near INFRARED OF THE Fraunhoferline C of hydrogen and in white light. These three exposures cover the magnetic plages, the umbra and penumbra of a sunspot, the prominences and filaments and flares. Ordinarily special techniques of polarization are needed for magnetic pole strengths.

These photographs have been made mostly by scans of the sun on a spectroheliograph and then read by eye estimates of intensity, area and position, with the aid of a small reseau and a stoneyhurt grid. Then the photographs are filed away for future reference.

There is a better way to measure this activity by digitizing the sun's image with a scanner as it drifts across the entrance slit of the spectroheliograph so that a numerical value of the surface of the sun in square millimeters may be printed out with the aid of a computer. The computer is programmed to print out the values that fit into the image of the sun.

This procedure has some electronic and mechanical problems. In scanning the rotating disk must match the speed of the sun's image so that the light pulses recorded by the detector will be put in their proper place on a numerical map of the sun. The digital multi meter which records these pulses must also be able to register at least 100 readings of at least 3 digits per second for a 100 micron slit and an image of the sun about 70 mm in diameter transiting the slit in 2 minutes.