

LETTER TO THE EDITOR

Received 9 February 1990

"Magnetic Fields of Peculiar Type-A Stars"

Professional astronomers are anxiously awaiting the launch of the Hubble Space Telescope (HST) to begin a new "golden" era of observations and discoveries. Five amateur programs have been chosen, from hundreds of entries, to receive precious observing time with the world's most sought-after telescope. The observing time for these amateur programs was made available by the director of the Space Telescope Science Institute (STScI), Dr. Riccardo Giacconi, and were selected by him following intense reviews by the Amateur Astronomers Working Group (AAWG) and by further reviews at the STScI itself. Each of the five selected programs will be run sometime between the seventh and nineteenth months after the launch, now scheduled for April 12, 1990.

One of these amateur observing programs involves a series of observations of a "peculiar" type-A (Ap) variable star, using the Goddard High Resolution Spectrograph (GHRS). The Ap stars are located just above the main sequence type-A stars on the H-R diagram, and have about the same relationship to the type-A stars as the beta Canis Majoris stars have to the normal type-B stars. The Ap stars are also located on the color-magnitude diagram where their ultraviolet excess is apparent.

The broadening, splitting, and different polarization of the spectral lines by the Zeeman effect reveal the presence of a magnetic field around the Ap stars. The magnetic variables were first analyzed by Horace Babcock in 1947 and have been extensively studied since that time.

The target star chosen is HD 112185 (HR 4905,  $\epsilon$  UMa) and displays a 5.0887-day variation in the spectral lines of the rare earth and iron peak elements. The spectral line changes coincide with a 0.03 magnitude variation in the star's brightness.

The target star's magnetic field is beyond the limits of earth-based photographic detection. The ultraviolet excess, the small-amplitude variation, and the measurement accuracy required demonstrate the need for space-based observations with the HST to determine the strength of the star's magnetic field.

A repetitive series of observations with the GHRS has been planned to measure the variation of this magnetic variable. The program has been "logged in" to the computer queue of other proposals awaiting planned observations with the HST. The results will appear in an astronomical publication and the data will also be archived permanently. As one of the five amateur astronomers chosen to work with the HST, I can only compare this opportunity to "sailing with Columbus."

Amateur astronomers will get another opportunity to work with the HST in the future. In the first seven months following the launch, the necessary calibrations and prove-out of the operations will be completed. This is referred to as "Cycle 0," and these first results will be widely reported. The professional astronomers and the five amateur astronomers whose programs have already been approved will have their programs "run" in the following twelve months of observations, which is called "Cycle 1." After the launch of the HST, the director of the STScI will be making a formal announcement about future amateur observations, in the following cycle of observations. The proposals will again be reviewed by the AAWG.

I would like to thank the director of the AAVSO, Dr. Janet Mattei, and all of the other members of the AAWG for their efforts in this program to take amateur astronomers to new vistas.

**REFERENCE**

Babcock, H. 1947, *Astrophys. Journ.* **105**, 105.

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