# INCREASE IN SENSITIVITY OF PHOTOELECTRON MULTIPLIER (PHEM)

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ABSTRACT. Plots of spectral sensitivity as a function of voltage are obtained. A conclusion can be made on the spectral sensitivity shift with voltage increase towards longwave spectrum region.

**Key words:** Instrumental: multipliers.

Astronomical investigations in the fields of photometry (PHM) and spectrophotometry (SPHM) are carried out by using different photodetectors (PHD) including photoelectron multipliers (PHEM).

Photodetectors differ in spectral sensitivity, range and other parameters, and for each task it is necessary to select its own PHS. It should fit the best characteristics simultaneously in several regions, frequently incompatible ones. So, for SPHM and PHM, photoelectron multipliers are needed with a large spectral range, uniform sensitivity over the spectrum, a good signal–noise relation, small overall dimensions, not high supply voltages, slight sensitivity to the parameters of power supply, coolproof etc. It's no use enumerating all of them.

Our work deals with one verify PHEM pertaining spectral sensitivity. Light–emitting diodes with maximum radiation in points 560 nm, 660 nm and 700 nm have been chosen as radiation sources in three points over the spectrum.

In checking up some specimens of multislit PHEM it has been found that with the PHEM supply voltage change the maximum spectral sensitivity is shifted.

More particular results have been obtained in carrying out investigations with six specimens of PHEM by using with a wide spectral range. We have plotted spectral sensitivity as a function of wavelength (fig.1). The sensitivity is expressed in relative units whereas spectral characteristics in nanometres. In the plots are given serial Nos. of particular PHEM and supply voltages in volts.

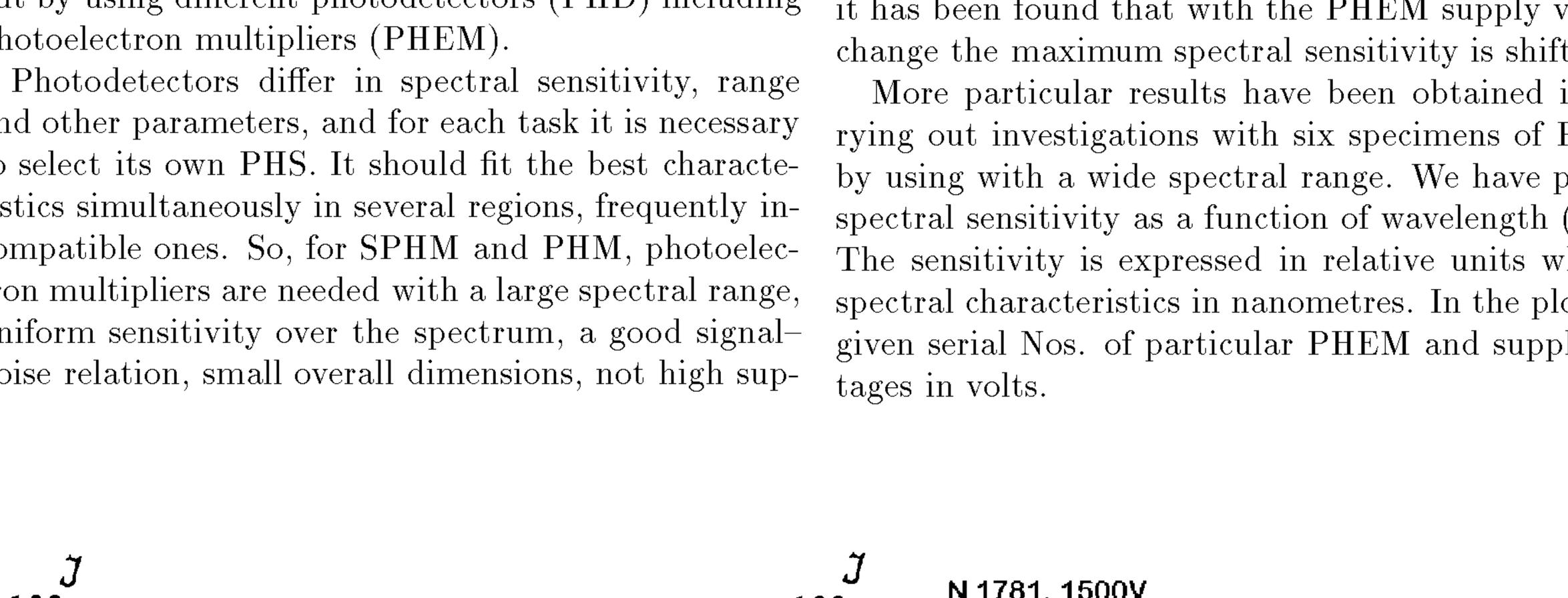


Figure 1(a,b): Variations of spectral sensitivity as a function of wavelength.

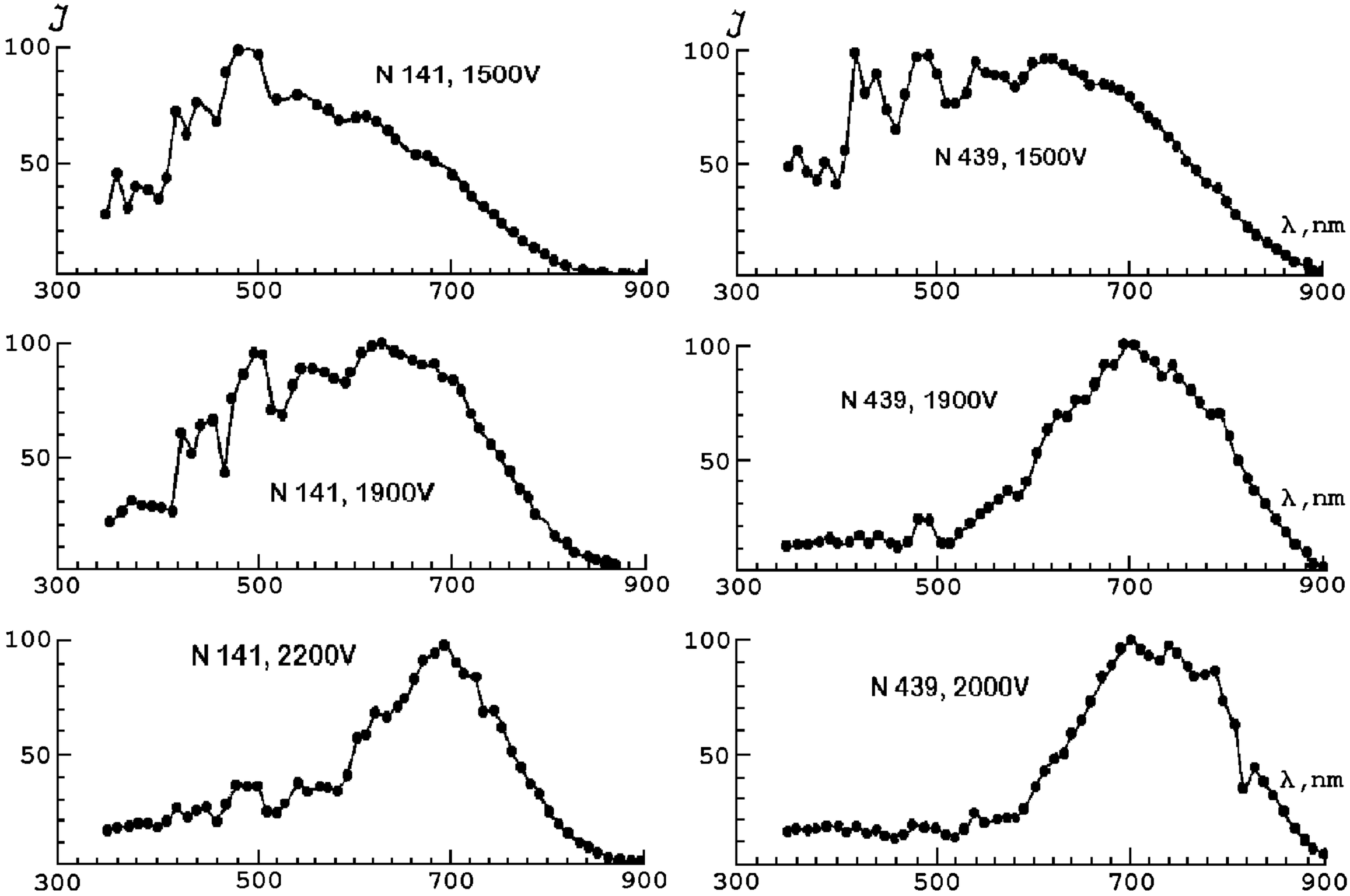


Figure 1(c,d): Variations of spectral sensitivity as a function of wavelength.

The following conclusions can be made:

— in stepping up the supply voltage, maximum spectral sensitivity of the PHEM is displaced towards a longwave range of the spectrum;

— the curve of spectral characteristics of PHEM changes rather spontaneously;

— for observations, it is necessary to choose PHEM according to spectral characteristics strictly keeping to the supply voltage chosen;

– there is a possibility of the PHEM spectral sensitivity variation control.

The last inference item implies the supply voltage control by the computer, i.e. in every part of the spectrum there should be the most efficient voltage for obtaining high signal–noise relation.