

PHOTOMETRIC DATA ARCHIVES

C. Jaschek
CDS, Observatoire Astronomique
Strasbourg / France

Astronomy being an observational science, it is clear that archiving must be an important part of our professional activities, because not preserving our observations means that we are building “on sand”.

Archiving photometric observations, and specifically CCD-type photoelectric observations, means essentially that we keep record of:

1. field center with coordinates and equinox, dimensions of the field,
2. the dates of the observations,
3. the technical details about the system we observed in (filters, receivers),
4. the details of the reduction process (sky background, extinction),
5. the names of the observers, the telescope they used and its geographical location.

Probably you will smile at such a list of details, but I would bet that except in a very few cases, much of such details are unavailable in the large majority of presently published papers providing photoelectric observations. Let me just quote a few consequences of its omission.

One of the most serious errors is the omission of observing dates. This is unforgivable for a professional astronomer and prevents many possible uses of the data – what if the star is later recognized as variable, eclipsing binary or nova?

Lack of filter specifications prevents use of practically all photometry done between the 1920's and the 1950's – observers measured with great care something down to a 1% level, but we do not know what they measured. Thirty years of observations lost!

Later on we learned that even it is not enough to tell the system, since individual filters may deviate considerably from average transmission curves, causing all kinds of secondary effects.

Reductions are performed nowadays usually at the telescope – this is fine but it would be better to know what procedure was used in order to get a real idea about the precision to be expected, even if the author claims $\pm 0m002$.

Clearly such a list could be extended, but I think the principle is clear – we must have behind us sufficient details so that our observations may be re-used. Astronomy is full of examples of observations which are used for purposes very different from the ones foreseen by its authors. For instance we would be grateful to Hipparchus and to Ptolemy if they

had left traces of how they set up the magnitude system, although they did not consider it something important – they were only interested if the number of stars was invariable or not. Their star positions were also used to derive proper motions of the stars, something whose very existence they denied.

What are thus the minimum requirements for a photoelectric archive? I have given at the start a list which I think contains the basic items. I shall simply add that of course each object must have an identifier *and* coordinates, to prevent that an error in one item invalidates the use of the observation. And then of course attention must be paid to engineering data of the telescope.

Sometimes the objection is made that observing dates are not very popular with magazines which prefer to “gain space” by omitting the column – but then leave half a blank page at the end of the paper. Similarly other “details” of my list are also left out “for editorial reasons”. Although I doubt that editors are that harsh, observers have no excuse for not providing these data to the observatory archives, which *must* become a permanent feature of all modern observatories.

Observatory archives should be started right away, if they do not exist.