SKY BRIGHTNESS AT TERAMO OBSERVATORY

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ABSTRACT. Recent CCD measurements of the sky brightness, giving a mean value $V = 19.25 mag/arcsec^2$ and $B = 19.60 mag/arcsec^2$ near the zenith, are presented. A brighter background is, of course, measured toward the town due to the light pollution.

1. The telescope of Teramo Observatory

The telescope in use at Teramo Observatory is a 72 cm equipped with a Tektronics CCD 512×512 (UBVRI system) or a photoelectric photometer (UBV). It became available since 1995 and from that epoch several papers based on observations collected at that telescope have been published concerning variability of both pulsating stars and peculiar objects (Brocato & Stiavelli (1997), Nesci et al. (1997), Castellani et al. (1998)). This is , if necessary, a further demonstration of the utility of small telescopes in long-time baseline researches. Although the sky brightness put severe constraints to the limiting magnitude, particularly in the direction of the town which is on the north-west of the Observatory, accurate differential photometry is possible down to $V = (16 - 17) mag$.

2. The sky brightness

To derive an estimate of the sky brightness we used the data collected during several photometric nights, from February to June 1998, devoted to calibrate the comparison stars of our program targets. During these nights all coefficients required for the calibration were derived, included the extinction coefficients, through the observation of several standard stars (Landolt 1992).

In the following table we report sky brightness estimates in both B and V filters and the extinction coefficients for each observing night. The measurements reported in table 1 are corrected for the extinction of the standard stars used as comparison, thus they have to be considered 'inside' the atmosphere at the given zenital distance z and hour angle HA. It is easy to verify that the sky brightness increases at positive hour angles (that is in the town direction) with a rate that can't be explained with the airmass contribution. Thus while the absolute values of the sky brightness for each night are quite large and meaningless (specially in B), let us to stress that an estimate of about 0.5 mag for the increase of the sky brightness going from the South to the West is a rather robuste evidence.

By averaging the data on table 1 one gets for a mean sky brightness (outside the atmosphere) the values $V = 19.25 mag/arcsec^2$ and $B = 19.60 mag/arcsec^2$ near the zenith.

Tab. 1 - Sky brightness measurements at different positions

Night	V_{sky}	k_V	B_{sky}	k_B	z	HA
18-02-1998	19.50	0.10	19.82	0.25	40°	$\simeq 0^h$
18-02-1998	18.92		19.45		55°	$+3^h$
20-04-1998	19.62	0.17	20.50	0.29	36°	$\simeq 0^h$
20-04-1998	18.89		19.64		64°	$+4^h$
21-04-1998	19.09	0.24	20.20	0.50	42°	$\simeq 0^h$
21-04-1998	18.24		19.54		63°	$+5^h$
29-06-1998	19.75	0.26	19.77	0.35	34°	$\simeq 0^h$
29-06-1998	19.42		19.68		47°	$\simeq +2^h$

References

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