WG A1 - Typical CHEOPS fields of views description

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December 10, 2014

To study the impact of contamination on CHEOPS performances, the stars in the FOV of five potential CHEOPS targets have been listed. The five targets have been selected to cover a wide range of contamination levels.

Catalog

Theses lists have been established with the USNO-B catalog. It provides the magnitudes in R, B and I bands and is complete to the 21st magnitude (V band), although sometimes not all bands are available. The USNO-B catalog was favored over the GSC because of its more complete description of extremely crowded fields, and over 2mass because of its higher magnitude limit.

Fields

The fields are circles of 730 arcsec radius, slightly wider than the CHEOPS FOV. This allows to take into account the field rotation and eventual pointing errors. They are also centered 10 arc min away from the target to avoid losing the central stars masked in the bright PSF of the target. The targets and numbers of contaminating stars are listed in Table 1.

Missing Values

Not every star possess information in all the B, R and I bands. There is between 25 and 30% of missing values in the I band, 10% in the B band and 5% in the R band. Every star has at least a B or R magnitude. Theses gaps are not magnitude dependent. The extreme contamination case shows many inconsistent values (up to mag 80 !). A cut has been made at the 22th magnitude. It is then less complete in the R band, with 15% of missing values.

Name	Vmag	Gal long	Gal lat	Nstars	Contamination
HAT-P-26	11.76	346.5135	+59.8731	979	Low
BD-082823	9.86	248.4966	+34.7560	1673	Medium
HD40307	7.1	186.4361	-00.4781	1785	Medium
HAT-P-23	11.94	058.9363	-11.8342	6040	High
HD154088	6.58	355.2373	+07.6735	29169	Extreme

Table 1: Targets properties, number of stars in the field and subsequent contamination

Format

Text file with the following fields :

distance ra dec Bmag Rmag Imag

Plots

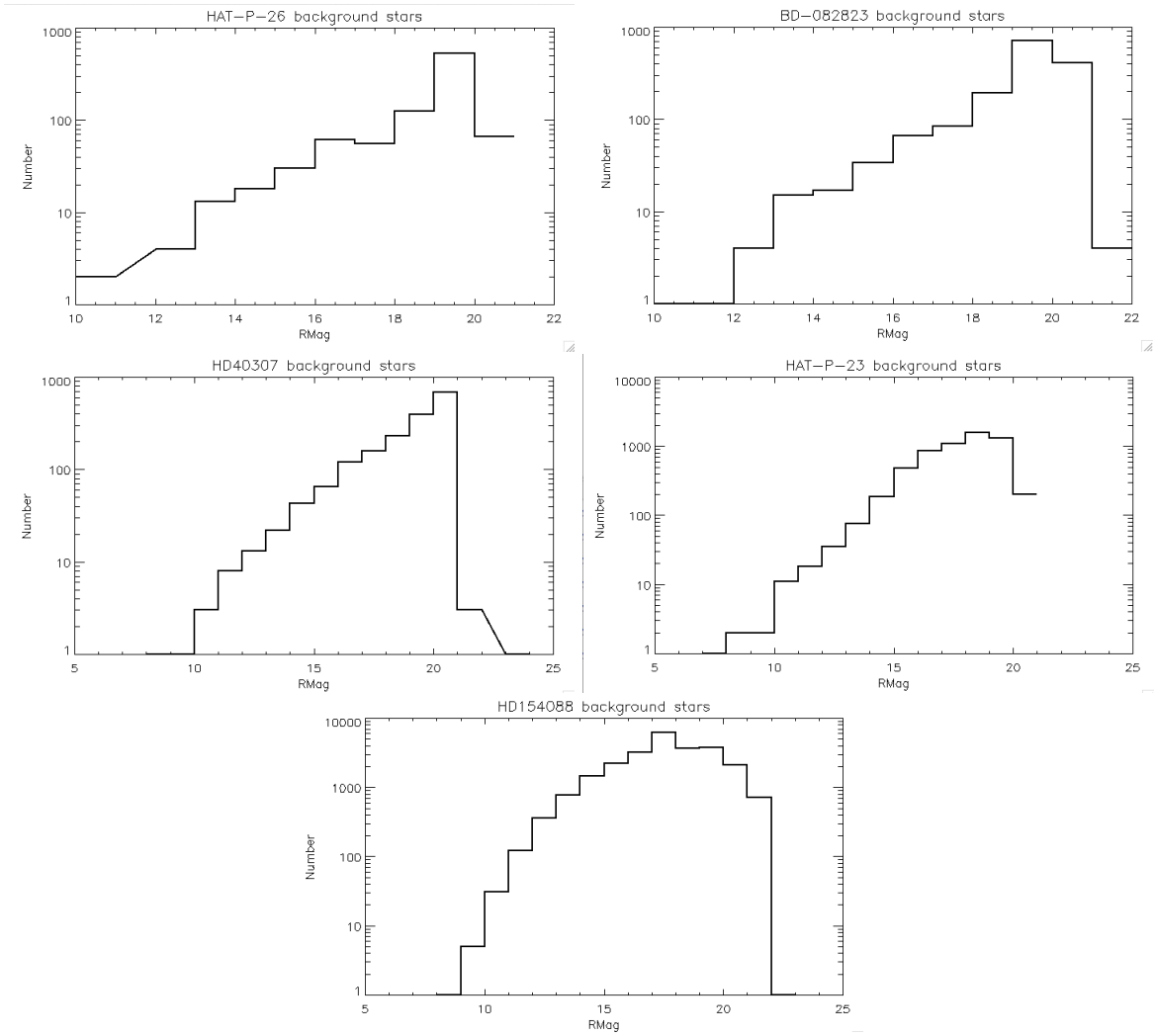

Figure 1: Magnitude distribution of the different lists in the R band. A diagonal bar means 0 stars in the bin. The catalog seems complete up to R=19-20, except in the extreme contamination case (R=17-18). This issue (similar but less dramatic than in the GSC) can be explain by higher exctinction or/and decreased survey efficiency.

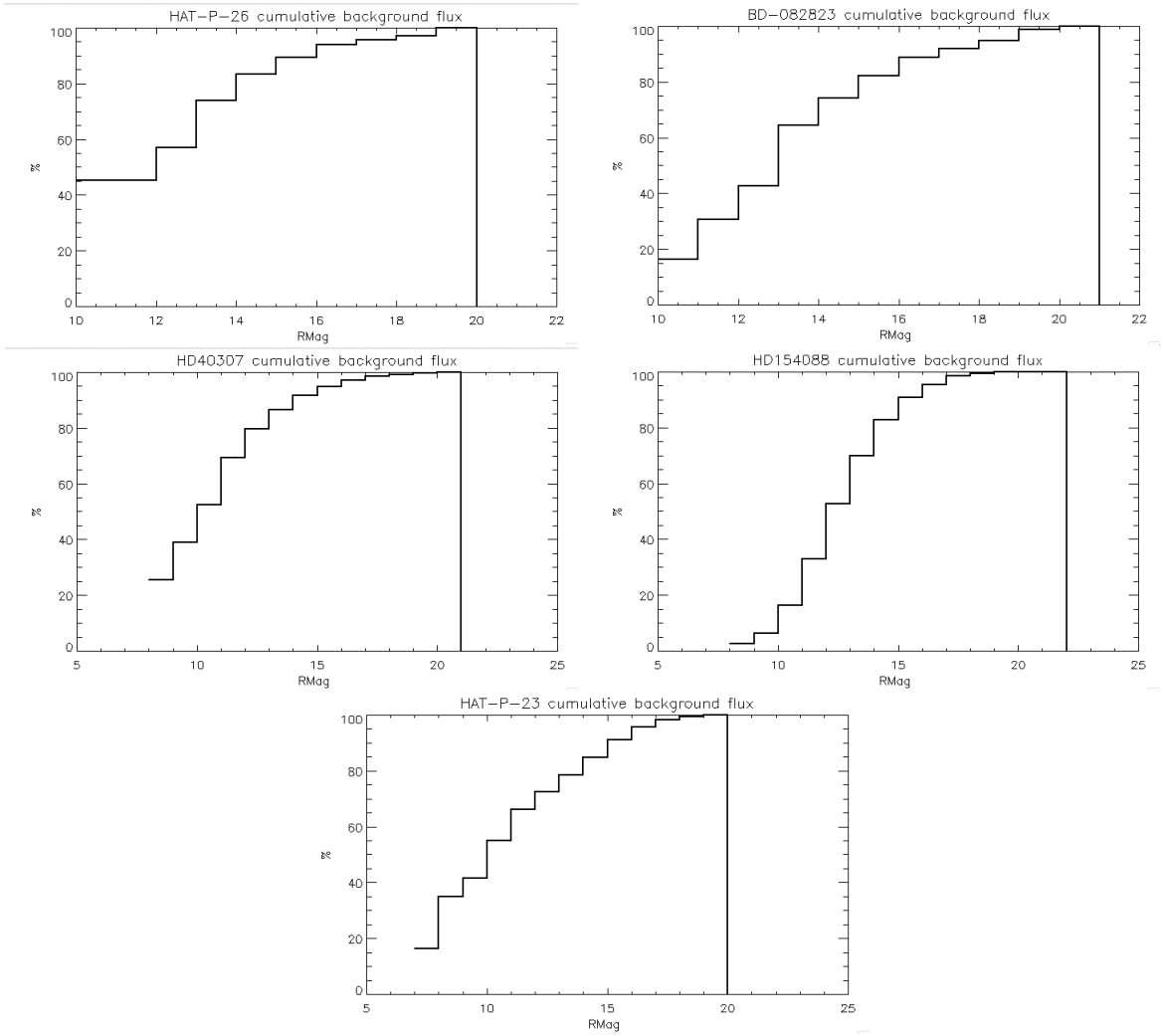

Figure 2: Cumulative background flux contribution of the different lists. In every case stars with R>16-17 account for about 10% of the flux.