Addendum: Exoplanet detection yield of a space-based Bracewell interferometer, from small to medium satellites

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planets100.txt

Table 1 shows the header and the description of each column of "planets100.txt". This file regroups all the information of each putative planet generated by our state-of-the-art planet population synthesis tool. More information about this tool is available in ref. 1.

Configurations

Each configuration (Tab 2 for related information) has its three own files (xxx is the name of the configuration):

- "xxxWavelength.txt":
  the integration time (in hours) for each planet (same order as "planets100.txt") **with no platform stability constraints** for different wavelength. The header of each column is the wavelength (in microns), from $0.5\,\mu\mathrm{m}$ to $19.5\,\mu\mathrm{m}$ with a step of $1\,\mu\mathrm{m}$.

- "xxxTiptilt.txt":
  the integration time (in hours) for each planet (same order as "planets100.txt") **with a relative tip/tilt angle** and the optimum wavelength. The header of each column is the tip/tilt angle (in mas), from 0 mas to 1000 mas with a step of 50 mas. There are no files for the CubeSat 6U configuration.

- "xxxOPD.txt":
  the integration time (in hours) for each planet (same order as "planets100.txt") **with a relative optical path difference (OPD)** and the optimum wavelength. The header of each column is the opd (in nm), from 0 nm to 75 nm with a step of 5 nm. There are no files for the CubeSat 6U configuration.

References

1 J. Kammerer and S. P. Quanz, "Simulating the exoplanet yield of a space-based mid-infrared interferometer based on *Kepler* statistics," *Astronomy & Astrophysics* **609**, A4 (2018). [doi:10.1051/0004-6361/201731254].

Header	Content	Unit
nMC	Number of the universe to which the planet belongs to	-
Rp	Planet radius	R_{Earth}
Porb	Planet orbital period	d
a	Planet semi-major axis	au
rp	Planet physical separation	au
ang_sep	Planet projected angular separation	arcsec
ang_sep_max	Max planet projected angular separation	arcsec
inc	Planet inclination	rad
Omega	Planet longitude of ascending node	rad
omega	Planet argument of periapsis	rad
theta	Planet true anomaly	rad
ecc	Planet eccentricity	-
Finc	Planet incident host star flux	S_{Earth}
Abond	Planet Bond albedo	-
AgeomMIR	Planet geometric albedo in the mid-infrared	-
AgeomVIS	Planet geometric albedo in the visible	-
f	Planet Lambertian reflectance	-
Tp	Planet equilibrium temperature	K
Mp	Planet mass	M_{Earth}
dist	Host star distance	pc
Rs	Host star radius	R_{Sun}
Ts	Host star effective temperature	K
Ms	Host star mass	M_{Sun}
stype	Host star spectral type	-
zodis	Exozodiacal dust level	-
ra	Host star right ascension	deg
dec	Host star declination	deg
nstar	Number of the star	-

Table 1 Header and description of each column of planets100.txt.

	CubeSat 6U	**CubeSat 12U**	**PROBA-size**	**FKSI-concept**
Size	$0.6 \times 0.1 \times 0.1\,\mathrm{m}$	$1.1 \times 0.1 \times 0.1\,\mathrm{m}$	$1\,\mathrm{m}^3$	
Baseline length	$0.5\,\mathrm{m}$	$1\,\mathrm{m}$	$5\,\mathrm{m}$	$12.5\,\mathrm{m}$
Pupil diameter	$0.08\,\mathrm{m}$	$0.08\,\mathrm{m}$	$0.25\,\mathrm{m}$	$0.5\,\mathrm{m}$
Optical train temperature	$150\,\mathrm{K}$	$150\,\mathrm{K}$	$100\,\mathrm{K}$	$60\,\mathrm{K}$
Optimal wavelength	$0.5\,\mu\mathrm{m}$	$1.5\,\mu\mathrm{m}$	$2.5\,\mu\mathrm{m}$	$4.5\,\mu\mathrm{m}$

Table 2 Four studied configurations considered in this study, from nano to medium-size satellites.