

The RAPAS network

Réseau Amateurs Professionnels pour les Alertes Scientifiques

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and RAPAS members

The RAPAS network

- Funded by Scientific council of Paris Observatory
- Action Pluriannuelle Incitative : API ProAm
- Starting in 2022, continued in 2023, 2024, 2025

- Increasing number of alerts for observations
 - Gaia : Gaia-FUN-SSO & various astrophys. Alerts (2016-2025) & Follow up (> 2025)
 - Atlas, ZTF, ASAS-SN, BHTOM...: SN, GRB,...need optical counterparts of transients
 - Next: In the era of LSST, numerous alerts will be triggered
- Benefits of working with amateurs

The RAPAS network

- Number of observers, flexibility, long term follow up
 - rapid response to alerts
 - Geographic coverage
 - Combating adverse weather conditions
- ...but need for guidance and coordination

The RAPAS network

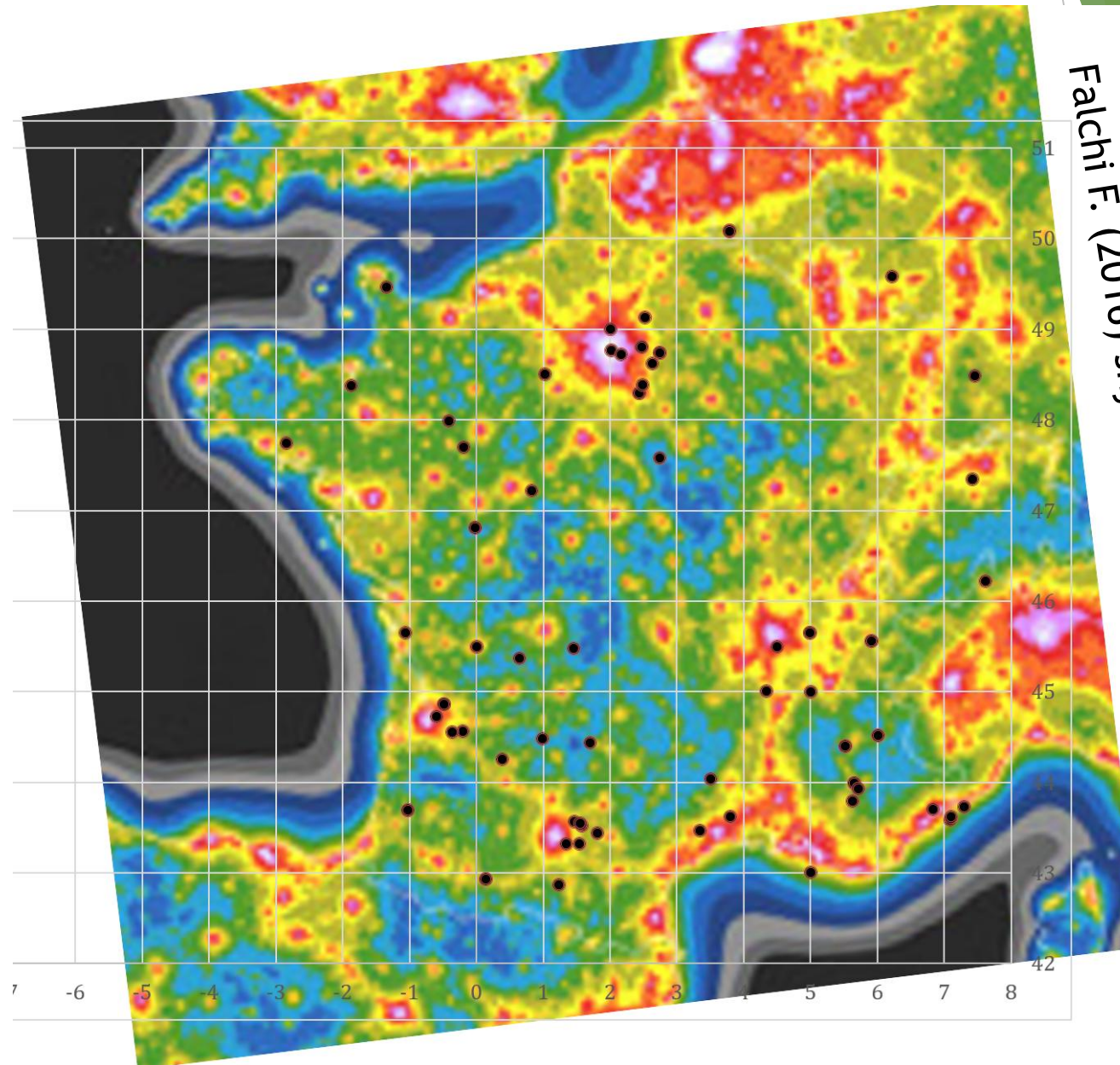
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 - Combating adverse weather conditions
- ...but need for guidance and coordination

- Annual workshops (2022, 2023, 2024)
- 2025: Observation on alert and workshop at Haute Provence Obs. (OHP IAU 511)
- Web pages: <https://rapas.imcce.fr>
and <https://gemini.obspm.fr/20220101-rapas/>
- mailing list: RAPAS@groups.io

The RAPAS network

96 French amateurs
using 60 telescopes or
shared observatories
in France
+10 abroad

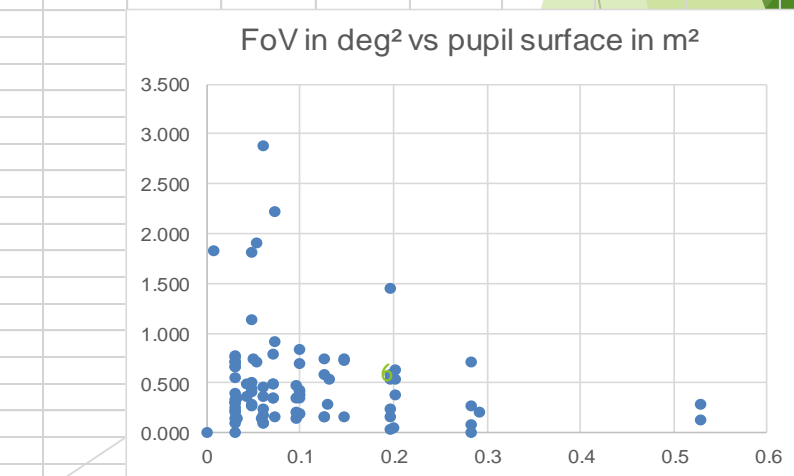
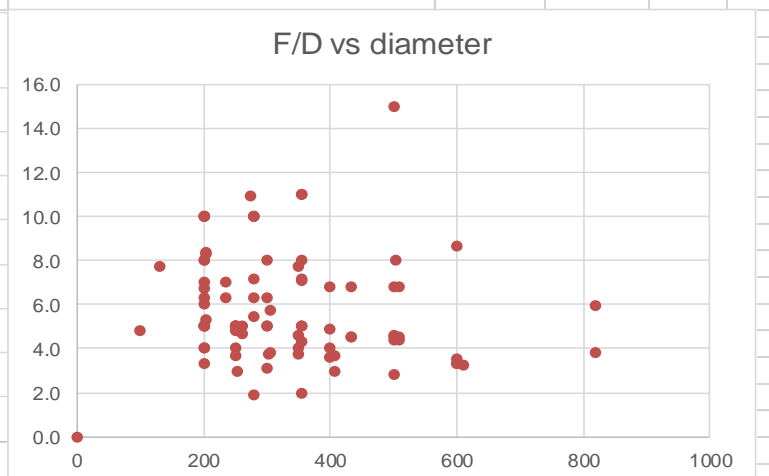
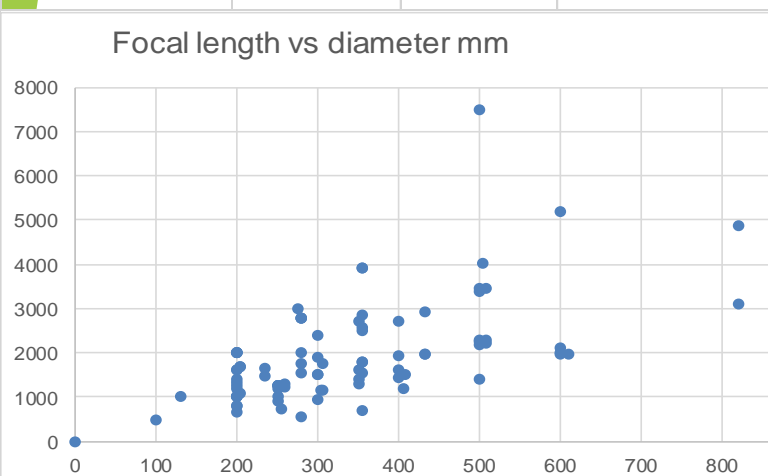
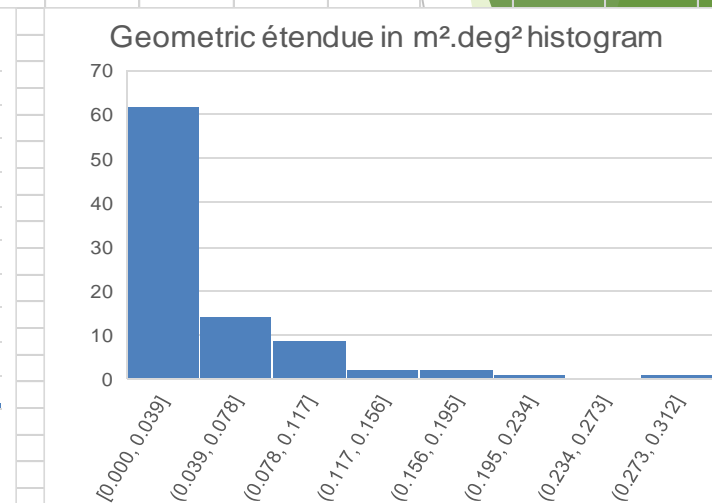
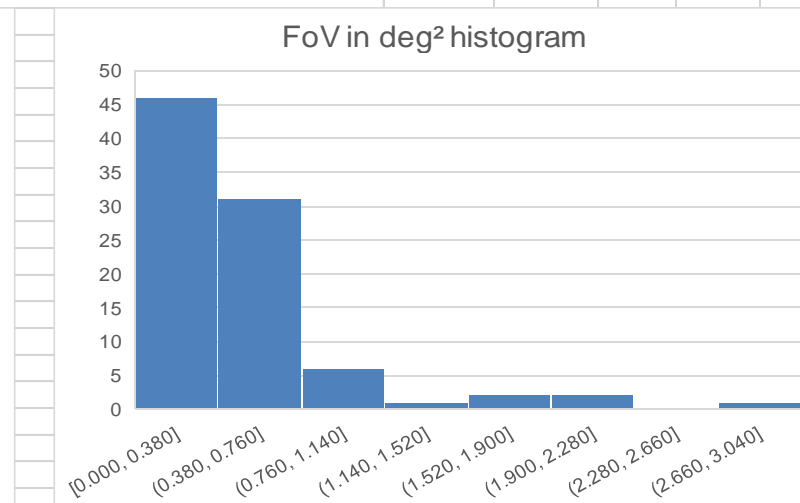
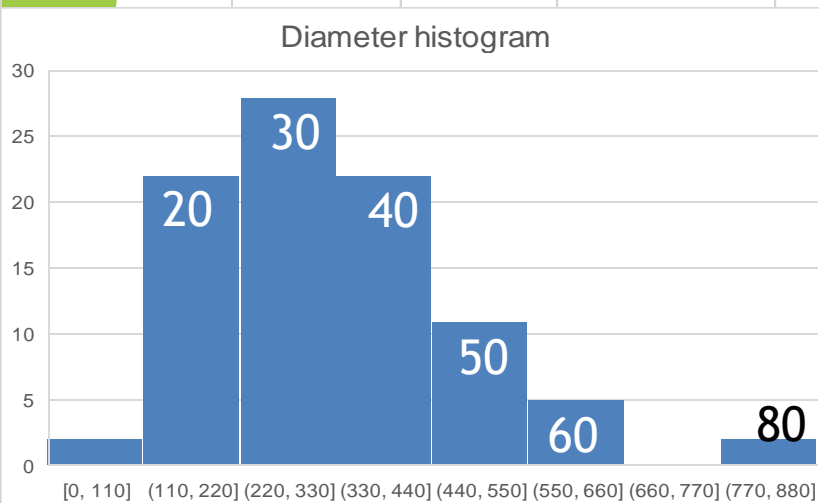
- Club Eclipse
- ARAS AUDE
- Dauban Grappa
- TJMS Buthiers CPS Planète Sciences
- AT60
- Adagio Observatoire de Belesta
- Astroclub Charantais
- Société Astronomique de Touraine
- Observatoire de Dax
- Observatoire Rosheim - TRBL
- Uranoscope de l'Île de France
- Observatoire des Pises
- Observatoire Saint Pardon de Conques
- CEPHEE73
- Observatoire de Benayes
- Deep Sky Chile
- Observatoire des Baronnie Provençale
- Astronomie Gironde 33
- Escalier aux étoiles
- Obs du Clocher de Brantôme en Périgord



Falchi F. (2016) sky map pollution

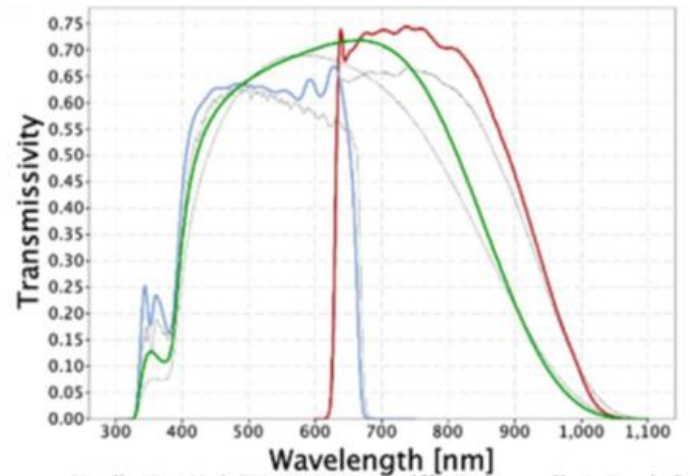
The RAPAS telescopes

- Most telescopes have a diameter between 20 and 40 cm
- 10x50cm 5x 60cm and 2x80cm
- Various characteristics (FoV)



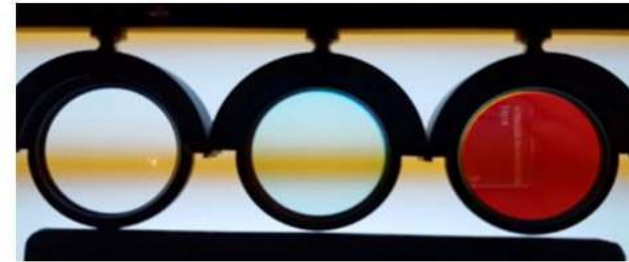
The RAPAS filters

- Goal: use of Gaia bands
- consistency and uniformity of measurements, homogeneity with respect to the Gaia catalog
- design and manufacture (MCM corp.)
- RAPAS A (G), B(Gbp), C(Grp)
- 50 sets provided to amateurs
- + Pic-du-Midi (OMP)
- + Haute-Provence Obs.



(Crédits ESA/Gaia/DPAC, P.Montegriffo, F. de Angeli, C. Cacciari)

The three RAPAS filters : A, B, C



50mmx2mm

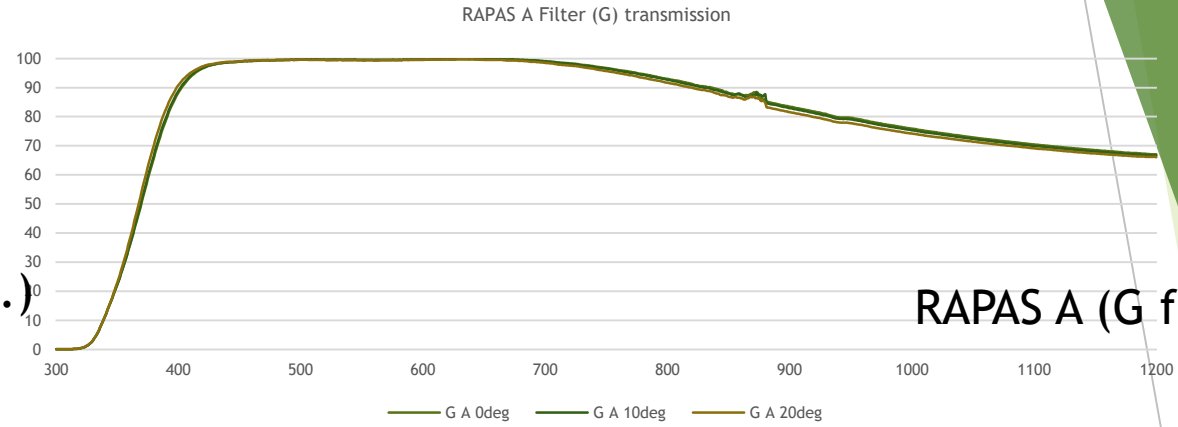


Pictures of the three filters A, B, C set : in 2022 a first batch of 25 filters set was released

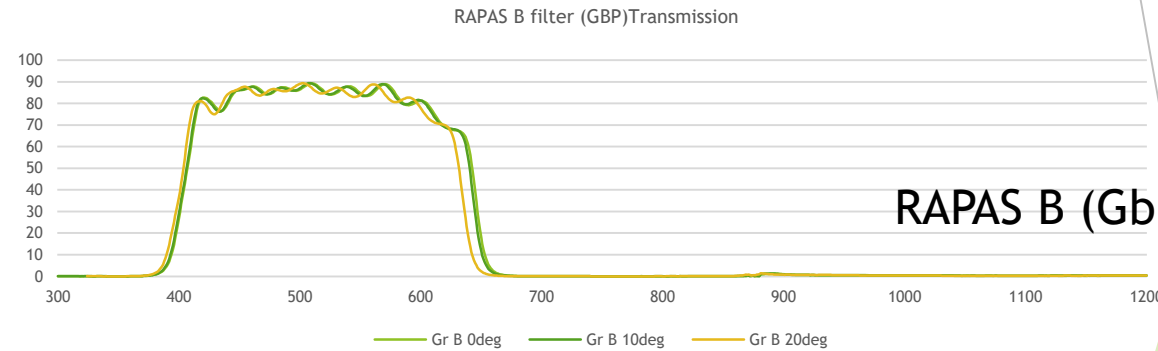
- Packing
- Normal transmission
- Aspect angle transmission
- Reflexion

The RAPAS filters

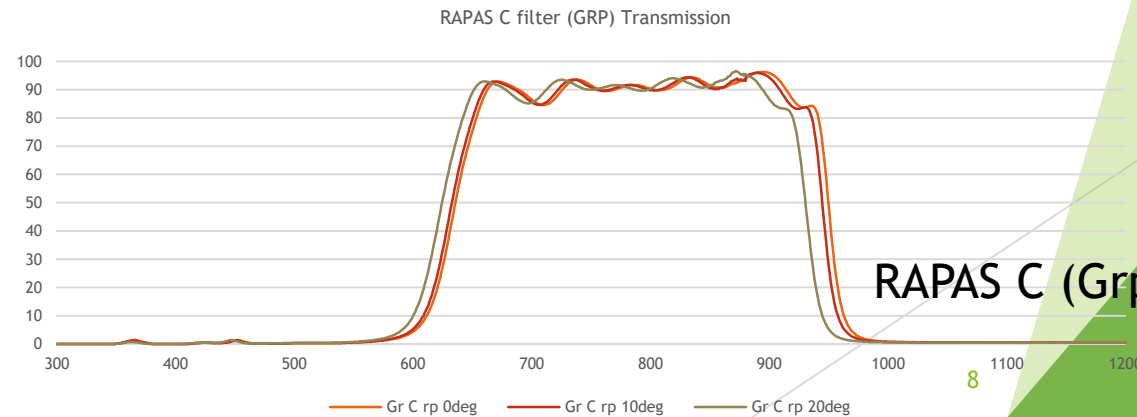
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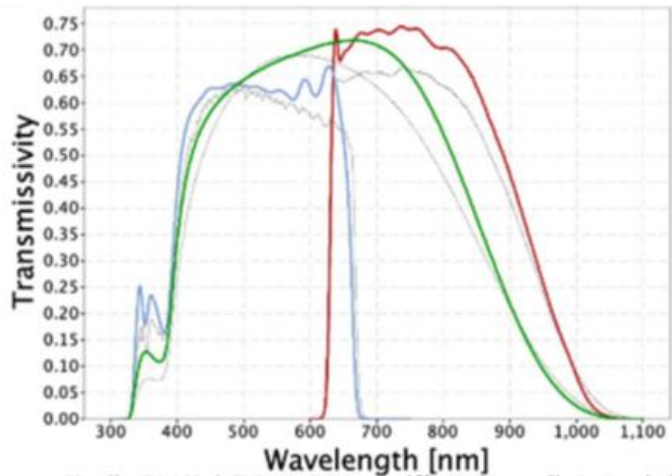
RAPAS A (G filter)



RAPAS B (Gbp filter)



RAPAS C (Grp filter)

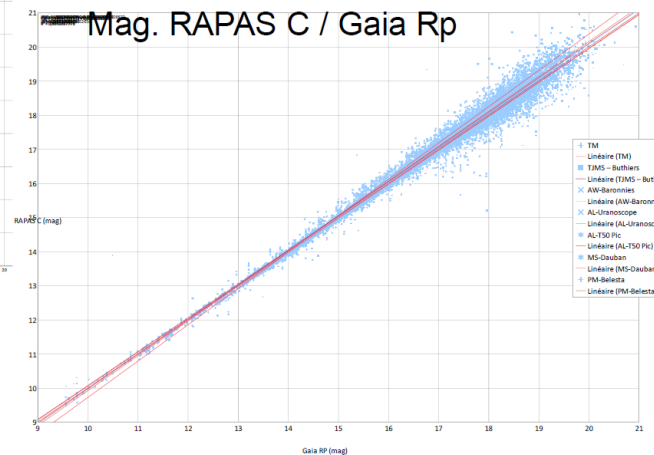
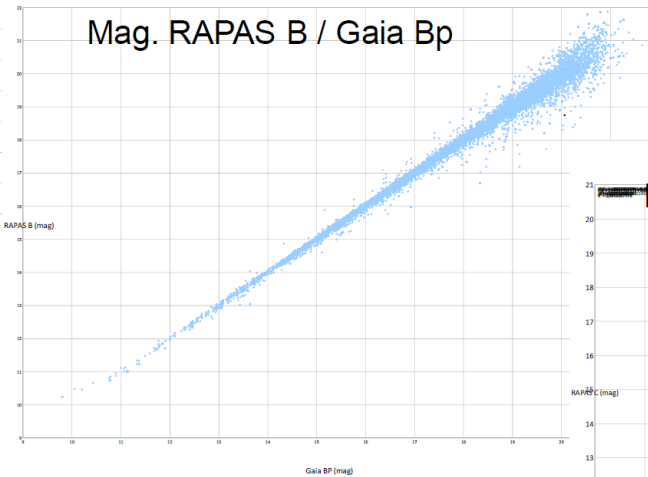
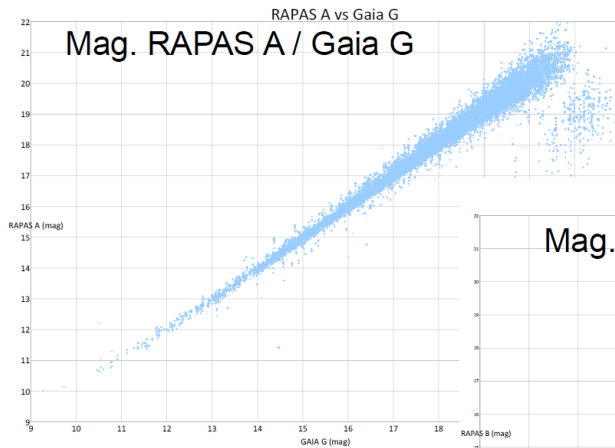


(Crédits ESA/Gaia/DPAC, P.Montegriffo, F. de Angeli, C. Cacciari)

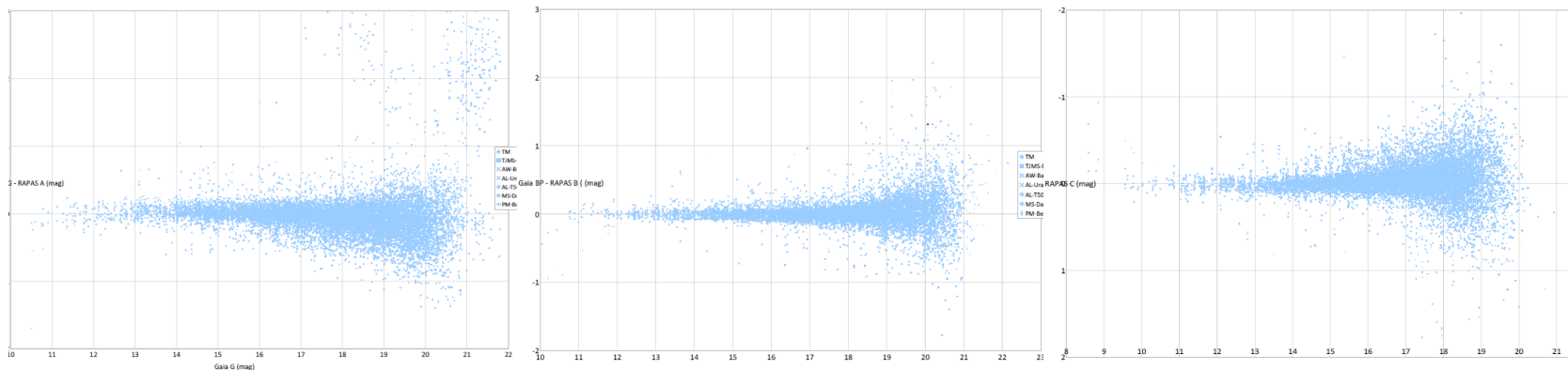
(Courtesy M. Grandidier & P. Barroy)

The RAPAS filters

Comparison of magnitudes measured using RAPAS filters with G, Gbp, and Grp magnitudes



Courtesy Marc Serrau (400mm, Dauban, TJMS,Eclipse)

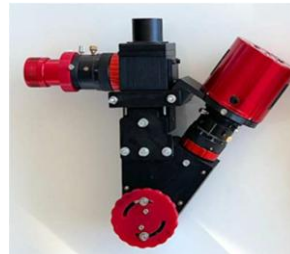


The RAPAS spectrographs

Production of 2 spectrograph prototypes relying on existing spectrographs

Goals:

- to allow high sensitivity for amateur telescopes
- to be able to provide a first characterization of the signature in getting the spectral energy distribution (SED).



R=100 1h exp.

30cm diam.: mag 18

60cm diam.: mag 20

still on test

Ch. Buil
(2003)

- **Alpy 200**

Fitted with a 200g/mm high efficiency transmissive grating instead of grism de 600g/mm with a two slit width (200 μ m 23 μ m)

- **Star'Ex VLR (Very Low Resolution)**

Equiped with a reflective 150 g/mm grating and optional objective focal length reduction from 80mm to 40mm

The RAPAS Astro-Colibri pages



Astro-COLIBRI / RAPAS filtering of alerts
Collab. with Fabian SCHÜSSLER et al. (CEA IRFU)

Deliver selected new alerts to RAPAS network,
with low latency, and meeting the amateur constraints:

- Website and phone app
- Alerts filter from a wide range of brokers
- Selection up to ten alerts a week fitted to the RAPAS capability (e-mails)
- Perform the alert monitoring for optical alerts in G Gbp Grp color index
- End of each week alert poll for observers during the week or intending to observe next week :
either we continue the monitoring or we stop it
- Every Friday issue the list of 10 RAPAS targets to follow on the next week
- Open a forum of discussion

The RAPAS Astro-Colibri pages

Astro-COLIBRI / RAPAS filtering of alerts
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<https://forum.astro-colibri.science/c/rapas/>

<https://astro-colibri.com/event:TNS2025rbs>

The screenshot displays the RAPAS Astro-Colibri web interface. The main content area shows a list of astronomical events with details for:

- AT 2025yqk**: Unclassified optical transient. RA/Dec: 93.64°/-26.07°. 2025-09-26 02:09:52.
- SN 2025rbs**: Supernova. RA/Dec: deg 339.27° 34.42°.
- GRB 250926A**: Gamma-ray burst. RA/Dec: 82.98°/-7.02° (± 1.82°). 2025-09-26 00:21:23.
- GRB 250925A**: Gamma-ray burst. RA/Dec: 341.20°/46.57° (± 0.05°). 2025-09-25 17:04:26.

The interface also includes a globe showing the sky map, a detailed info panel for the selected source (SN 2025rbs), and various filter buttons for observatories and event types.

The RAPAS results

78 alerts issued on 2024-2025 :

for each observation, the measurements are collected in a spreadsheet

SN2025vaw	ZTF25aarnzfi	SN2025geg	AT2024aasb	SN2024pmm
AT2025wbs	ZTF18acsugtc	GRB250327B	SN2024abfo	SN2024pie
V1413aql	AT2025kyz	Sb25032302	GRB241128A	SN2024kxi
AT2025usz	AT2025kwd	GRB250322A	AT2024abqt	SN2024kxi
V339Delp	GRB250521D	TCPJ05574222+3500099	SN2024aalt	SN2024iss
SN2025tzp	GRB250521B	SN2025erh	GRB241113B	SN2024inv
S2025sii	EP250511a	AT2025ere	SN2024ppd	SN2024igg
SN2025sei	GRB250510A	GRB250311B	SN2024yyu	SN2024bch
SN2025rbs	GRB250512B	SN2025coe	GRB240809A	
GRB250610B	GRB250506A	SN2025ccu	EP-WXTtrigger0170	
Sb25061207	GRB25051A	AT2025axj	AT2024qui	
RXJ1553.0+4457	SN2025ima	SN2025qe	SN2024pxl	
SN2025mvn	GRB250419A	AT2024afyi	SN2024pvw	
SN2025lyf	NuEm250417A	AT2024afyx	PNVJ19430751+2100204	
SN2025mbz	Sb25042207	SN2024aegm	TCPJ174-232	
SN2025mbd	GRB250416C	AT2024aezd	AT2024pns	
4FGLJ1311.0+3233	SN2024afyu	AT2024aehf	AT2024pnr	
4FGLJ1310.5+3221	StKM2-809	AT2024abol		

Spreadsheets: public access at <https://rapas.imcce.fr>

The RAPAS results

Spreadsheets to collect RAPAS observer measurements

RAPAS 2025 semestre1

Fichier Édition Affichage Insertion Format Données Outils Extensions Aide

Menus 100% 123 Par défaut 10

C11

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Nom de l'alerte	SN2025coe	incertitude														
2	Date de l'alerte	2025/02/24															
3	RA (deg dec)	158.28															
4	Dec (deg dec)	28.4															
5	galaxie hôte	ngc3277															
6	Nature	Type Ib-Ca-rich															
7	magnitude découverte	17.40															
8	z	2															
9	Commentaire																
10	Statut AstroCOLIBRI/RAPAS																
11	date de fin de l'alerte																
12																	
13	Fait l'objet d'un TNS																
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21	DATE	TC HH:MN:S	MJD	RA deg dec	Dec deg dec	magnitude A/G	incertitude A/G	magnitude B/Gbp	incertitude B/Gbp	magnitude C/Grp	incertitude C/Grp	indice B-C	upper limit G	Prénom Non	Commentaire	champ couvert en ° (degré	
22	06/03/2025	09:50:24	60 740.4100			16.43	0.02	16.71	0.02	16.54	0.02	0.16		Pierre-Yves Lechapelain		85°x85'	
23	28/02/2025	20:31:00	60 734.8549	158.28295	28.43686	16.49	0.06							Marc Serrau		30°x20'	
24	28/02/2025	21:52:00	60 734.9111	158.28	28.437	16.56	0.07	16.86	0.06	16.30	0.11	0.56		Arnaud Leroy			
25	28/02/2025	22:19:00	60 734.9299	158.28	28.437	16.27	0.05							Jean-Louis Dumont (SAT37)		0.185	
26	01/03/2025	04:38:53	60 735.1937			16.51	0.02	16.81	0.03	16.38	0.02	0.43		Pierre-Yves Lechapelain		85°x85'	
27	01/03/2025	10:53:02	60 735.4535					16.81						Jean-Baptiste Marquette			
28	01/03/2025	11:05:55	60 735.4624			16.53								Jean-Baptiste Marquette			
29	01/03/2025	11:39:29	60 735.4857					16.82						Jean-Baptiste Marquette			
30	01/03/2025	11:54:58	60 735.4965			16.53								Jean-Baptiste Marquette			
31	01/03/2025	23:00:38	60 735.9588			16.50	0.08	16.79	0.09	16.29	0.17	0.50		Marc Serrau		30°x20'	
32	02/03/2025	23:04:50	60 736.9617			16.37	0.22	16.75	0.07					Marc Serrau		30°x20'	
33	03/03/2025	23:50:48	60 737.9936			16.44	0.07	16.78	0.06	16.05	0.16	0.73		Marc Serrau		30°x20'	
34	03/03/2025	21:06:46	60 737.8797			16.52	0.06	16.73	0.07	15.89	0.18	0.84		Bernard Tregon	30x60s /filtre	39°x31'	
35	03/03/2025	23:24:43	60 737.9755			16.525	0.023	16.79	0.02	16.13	0.10	0.66		Pierre-Yves Lechapelain		85°x85'	
36	04/03/2025	21:34:27	60 738.8989			16.54	0.01	16.84	0.02	16.04	0.12	0.80		Pierre-Yves Lechapelain		85°x85'	
37	04/03/2025	22:03:22	60 738.9190			16.41	0.08	16.78	0.07	15.98	0.08	0.80		Marc Serrau		30°x20'	
38	05/03/2025	21:39:53	60 739.9027			16.46	0.05	16.84	0.04	15.99	0.18	0.85		Marc Serrau	magV=16.68+/-0.04 g=16	30°x20'	
39	05/03/2025	22:06:00	60 739.9208			16.62	0.11	16.97	0.10	16.15	0.08	0.82		Fred DENJEAN	6x120s	63°x42'	
40	05/03/2025	22:30:05	60 739.9376			16.33	0.09	16.64	0.11	15.96	0.10	0.68		Bernard Tregon	30x60s /filtre	39°x31'	

ALPES - octobre 2025

SN 2024afyu StKM 2-809 SN2025geg GRB 250327B sb 25032302 GRB 250322A TCPJ05574222+3500099 SN2025erh AT2025ere GRB250311B SN2025coe

Some references

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Conclusions

Next future:

- Strengthening collaboration Pro
- 10 observers abroad > extension
- New generation of Filters (improvement of RAPAS B (Gbp))
- New set of filters to distribute
- Data archiving @obspm (the Paris Observatory - PADC)

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