



ExoClock Newsletter

Dear ExoClock participants,

Hope you are all doing well!

We would like to welcome the new members!

We send out a newsletter like this at the beginning of every month, while you can read the past newsletters, watch the past meetings, and have access to other educational material at:

www.exoclock.space/users/material

We also organise meetings dedicated to new ExoClock members. These meetings are held just after our regular monthly meeting. The beginner's meeting is usually held on the Friday after our regular meeting or the week after. In these meetings, newcomers have the opportunity to ask questions of any level related to the operation of the website, observations of transits, data analysis etc. Note that these meetings are not recorded.

*Finally, we have a **Slack channel** for more direct communication and if you want to join, follow this link:*

https://join.slack.com/t/exoclock/shared_invite/zt-1t5l875v6-x0s8s553kT8nbCvbyo7boA

In this newsletter, we discuss:

1. Announcements

1.1. Stellar Monitoring working group

1.2. HOPS updates

1.3. New monthly meeting on HOPS technical issues

1.4. Survey for the 3rd ExoClock annual meeting

1.5. Invitation to the 5th EVS (European Variable Stars) Meeting

2. Targets with TTVs

3. Observing campaigns

4. Highlighted Observations

1. Announcements

1.1 Stellar Monitoring working group

A new activity that we plan to start as part of ExoClock, in collaboration with the Stellar Characterisation working group of the Ariel consortium, is the monitoring of the stars that host Ariel candidates. This is important to understand the level of activity that these stars have and also to determine their rotational periods. For this exercise we need to observe the star out of transit for about one hour every few days/weeks for a long period of time, usually of the order of months. We will start with a pilot this summer, as the nights are getting shorter and shorter! The goal is to observe 3 stars for ~1 hour out of transit every ~5 days! If you are up to the challenge fill your name and e-mail in this form:

<https://forms.gle/cbphUqjQpbsgEgKL6>

1.2 HOPS updates

There is a new version of HOPS available online at:

<https://www.exoworldsspies.com/en/software/>

This is version 3.1.1 where we have tried to solve issues with alignment and location selection that many of you reported. This version used the twirl package for faster alignment after meridian flips. Many thanks to Jean-Baptiste Marquette for pointing to this package during our 2022 annual meeting. Plate solution is on the way!

1.3 New monthly meeting on HOPS technical issues

During our previous meeting we discussed the idea of organising a separate meeting where we can solve issues related to the HOPS software. We plan to hold these meetings once a month and to find the best date/time for most of you we have prepared a small poll. We would really appreciate it if you could spare a moment to fill in this small survey!

<https://forms.gle/iS4WMyfUy3sQJxCd8>

1.4 3rd ExoClock annual meeting

As we did last year, we plan to have a hybrid annual meeting this October, after EPSC2023. To better organise the 3rd ExoClock annual meeting, we need to hear your opinion! We are thinking of holding the meeting in **Greece**, the **UK** or the **Netherlands**.

Before we start preparations for this, we would like to hear which of these locations is the most preferable and whether you would be willing to attend in person. We have prepared a very small survey which you can find here:

<https://forms.gle/SEp3UCKqusyTHpys6>

Thanks everyone, your feedback is necessary to find the best dates and location for our next meeting!

1.5 Invitation to the 5th EVS (European Variable Stars) Meeting

The 5th EVS meeting will take place in **Barcelona** on the **27th and 28th of May**. The meeting aims to promote astronomical citizen science, collaboration between the different European variable star

organisations and improve Pro-Am collaborations. **Mercedes Correa** and **Florence Libotte** – very active ExoClock members and members of the organising committee – are inviting all ExoClock participants to join the meeting. The language of the meeting will be **English** to facilitate the majority of the community. You are also welcomed to submit an abstract related to exoplanets!

The deadline for the abstract submission is on the **1st of May**.

More details can be found here: <http://rr-lyr.irap.omp.eu/photometry/EVS5/>

2. Targets with TTVs

We have added a new flag on the targets, the **TTVs** flag! At the moment, there are only a few targets with this flag. Similarly with the alert and high priority targets these are very important to be followed up. Certainly, you can observe them and give priority if they appear in your scheduler. However, there are some tricky cases like TOI-216.02b which has TTVs of +/- 500 min and this means that it is impossible to be observed. So, in the case of very large TTVs don't observe the transits as you will not capture anything. In the recent future there will be a group dedicated to exploring further these planets.

KOI-12b (TTVs) Min. aperture: 5.0" Total Observations (Recent): 73 (0) O-C: -	0 (0)	73 (0)	0 (0)	0 (0)	2455711.66072 ± 0.00011	17.8552276 ± 4.5e-06
KOI-13b (LOW) Min. aperture: 5.0" Total Observations (Recent): 774 (12) O-C: 0.42 ± 0.19 minutes	12 (12)	762 (0)	0 (0)	0 (0)	2455777.161331 ± 7.1e-06	1.763587619 ± 2.8e-08
KOI-94c (TTVs) Min. aperture: 75.99"	0 (0)	54 (0)	0 (0)	0 (0)	2455679.81939 ± 0.00051	10.423671 ± 1.2e-05

3. Observing campaigns

Our current campaigns are for two TOI planets: **TOI-2076b** and **TOI-1789b**, both observable from the Southern hemisphere.

The transit for **TOI-2076b** is happening today, the **13th of April**. If you are interested in observing the target, please check your emails for the separate email we sent you a few days ago.

The transit for **TOI-1789b** is happening between **Wednesday the 19th of April 20:52 UTC and Thursday the 20th of April 01:11 UTC**.

If you have a telescope between 8 and 14 inches, you can give it a try and observe those transits.

Note that these transits will NOT appear in your scheduler so you will need to organise your observation yourselves. You can check the ExoworldsSpies scheduler to see if the transit is observable from your location (you should use a telescope aperture of 18 inches, otherwise the planet will not appear):

<https://www.exoworldsspies.com/en/scheduler/>

Remember that the exposure time should be longer than your overheads (dead time between exposures). To be able to have a decent exposure time you may need to use a filter -preferably Red Cousins- or to defocus your telescope.

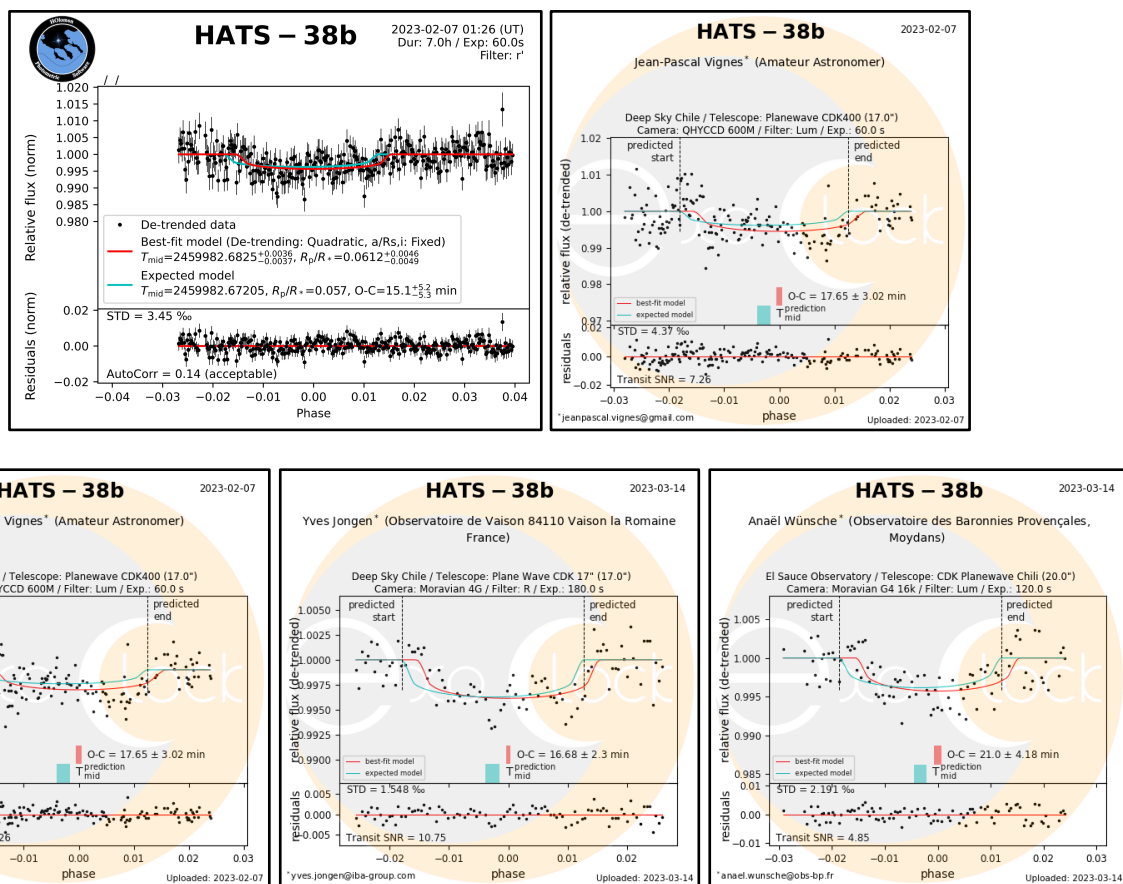
You wouldn't need to do anything special in terms of the analysis, just upload the observations to ExoClock in the normal fashion. Please indicate in the comment section that the observation is "part of the synchronous observations campaign".

4. Highlighted Observations

We would like to thank you all for the observations you contributed to the previous months!

We have selected **HATS-38b**, a new target that has been flagged as **high priority**. On the 7th of February, two observations (one from the remote observing group and one by Jean-Pascal Vignes) showed a time shift of **around 30 minutes** and the target marked as **ALERT**. On the 14th of March, Yves Jongen and Anaël Wünsche observed the planet again and confirmed the shift.

Thank you all for your observations and congratulations!



Many thanks to all observers for all the efforts so far!

Clear Skies,
the ExoClock team