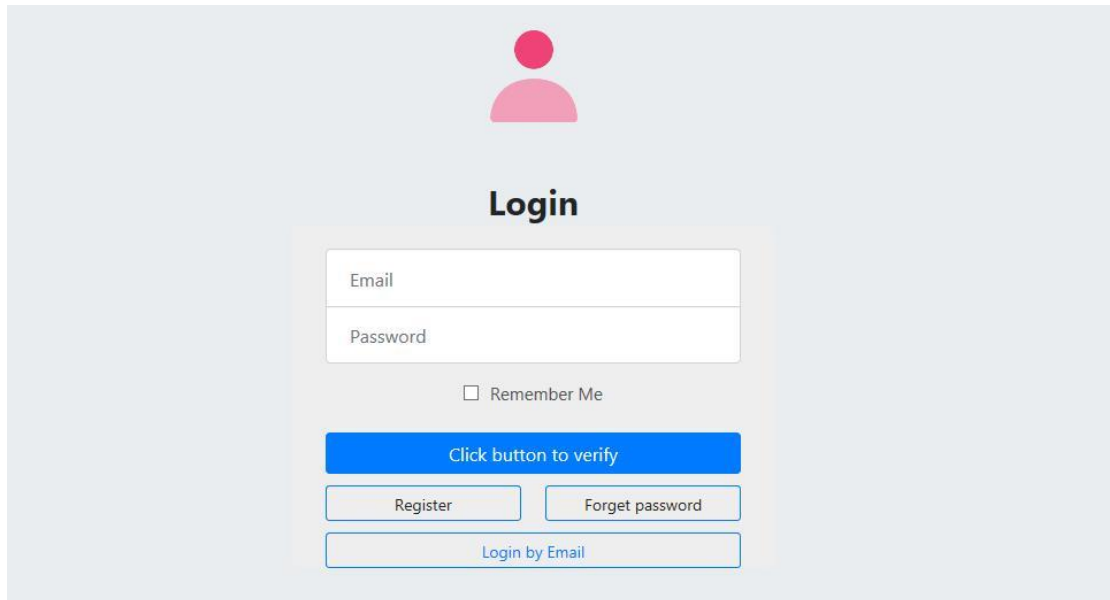


Instructions for submitting observation parameters

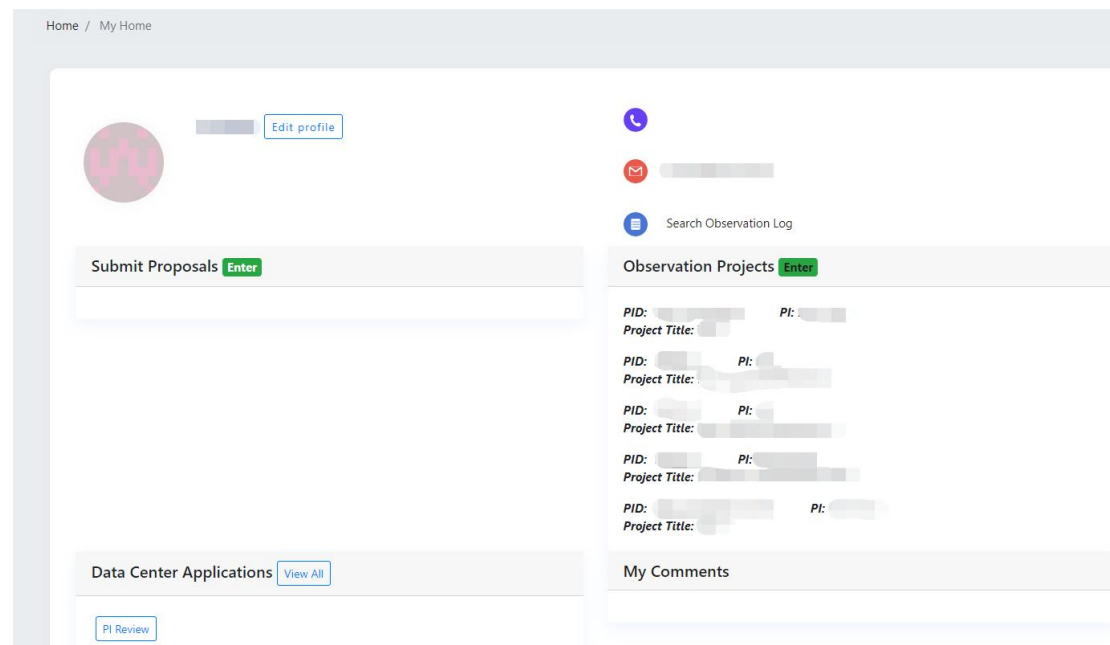
V2.3

Website address: <https://fast.bao.ac.cn/> You can choose English or Chinese version.

1. Register. Enter the login page to register. You need to login again, with your email account and password, press the button "Click button to verify" to login.

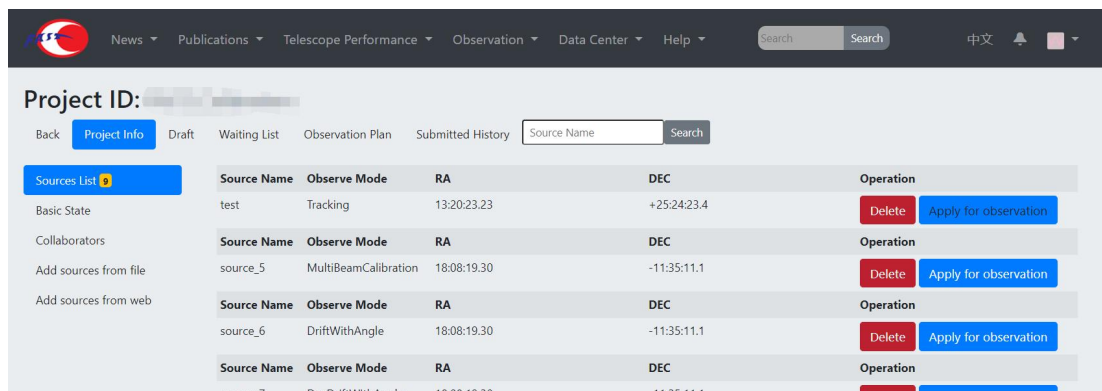
A screenshot of the login page. At the top center is a pink circular icon representing a person. Below it, the word "Login" is displayed in a bold, black font. The login form consists of two input fields: "Email" and "Password". Below these fields is a checkbox labeled "Remember Me". A prominent blue button with the text "Click button to verify" is positioned below the checkbox. At the bottom of the form are three buttons: "Register", "Forget password", and "Login by Email". The entire form is set against a light gray background.

2. After logging in, click on "my home", you can see your own project, which contains your PID and Project Title.

A screenshot of the "My Home" page. The top navigation bar shows "Home / My Home". The main content area is divided into several sections. On the left, there is a profile section with a pink circular icon and an "Edit profile" button. Below this is a "Submit Proposals" section with an "Enter" button. At the bottom left is a "Data Center Applications" section with a "View All" button and a "PI Review" button. On the right side, there is a "Search Observation Log" section with a magnifying glass icon. Below it is an "Observation Projects" section with an "Enter" button, displaying a list of projects with columns for "PID:" and "Project Title:". At the bottom right is a "My Comments" section.

3. Click on the PID to enter your project setup page. This page includes: Project information, Draft, Waiting List, Observation Plan and Submitted History. Enter the parameter setting page by clicking on "Apply for observation". The sourcelist

of the allocated project has been uploaded by the FAST observation planning group. If you need to update the sourcelist or delete the existing source entered due to mistake, please contact the FAST observation planning group via email at (fastobs@nao.cas.cn).



The screenshot shows the FAST observation planning web interface. At the top, there is a navigation bar with links for News, Publications, Telescope Performance, Observation, Data Center, and Help. Below this, the 'Project ID' is displayed. The main content area has a sidebar with 'Sources List' selected. The main table lists sources with columns for Source Name, Observe Mode, RA, DEC, and Operation. The table contains four rows of source data, each with a 'Delete' button and an 'Apply for observation' button.

Source Name	Observe Mode	RA	DEC	Operation
test	Tracking	13:20:23.23	+25:24:23.4	Delete Apply for observation
source_5	MultiBeamCalibration	18:08:19.30	-11:35:11.1	Delete Apply for observation
source_6	DriftWithAngle	18:08:19.30	-11:35:11.1	Delete Apply for observation
source_7	DecDriftWithAngle	18:08:19.30	-11:35:11.1	Delete Apply for observation

If you are not clear about the parameters of various observation modes, you can refer to the documentation "FAST Observation Modes" in the help page.

Note 1: For the OnTheFlyMapping and MultiBeamOTF observation modes, users need to calculate the source scanning time according to parameters such as the size of the scanning area. If you don't know how to calculate, please refer to the documentation "FAST Observation Modes" in the help page.

(<https://fast.bao.ac.cn/cms/article/24/>)

Suggestion: the degree of rotation is 23.4 degrees for horizontal scanning (Along DEC line) and 53.4 degrees for vertical scanning (Along RA line). After adding the rotation angle, the spatial scale of the horizontal and vertical scanning of 19 beam is 21.66 angular minutes (scanning interval).

Note 2: In snapshot mode, the system needs to set the total time. The calculation method is the integration time of each point + 3 times of source changing time. For example, if the integration time of a location point is set to 300s, then the total time is required in this mode: $300 \times 4 + 3 \times 20 = 1260s$.

Note 3: For OnOff observation mode, users need to set the time of On source and the number of On-Off observation cycles.

4. Parameters page includes: Information, Observation Time, Basic Configuration, Backend Configuration, Noise Injection Time, and Special Instructions modules.

Note 4: The system has set the observation source group number for the user. The On and Off sources with noise switch and, On and Off sources with onoff observation mode must be assigned to the same group. As shown in the figure below, the serial number and sequence of groups can be modified and adjusted.

1	PSR B1929+10_OFF
	PSR B1929+10
2	PSR B2020+28_OFF
	PSR B2020+28

Note 5: if the Group number of these sources are the same, it means that these sources are continuously observed in the same day. If this is not required, the Group for each source should be set to a different number.

Note 6: It only needs to give the total application time (seconds) of each source. The specific observation date and time will be allocated by the observation planning group.

Note 7: Allow Delay: Yes/No. In general, select Yes. Only if the source must start on the specified date and at the specified time and the start time cannot be moved one second later, select Delay=No in this case.

The screenshot shows the "Observation Time" configuration panel. It contains four fields: "Group(>=1)" with an empty text box, "Time Reference Point" with a value of "0000-00-00 00:00:00", "Applied Time Length(second)" with an empty text box, and "Allow Delay" with a dropdown menu set to "Yes".

5. Basic Configuration. Set the rfgain and dgain values according to the flux of the source. If you do not know how to calculate, please refer to the documentation "FAST Digital Backends and Science Data" in the help page.

The screenshot shows the "Basic Configuration" panel. It includes a "Feed" dropdown set to "1.05G-1.45G(MB)", a "Focus Ratio" dropdown set to "0.4621", an "rfgain(-11.5 ~ +20)dB" text box, and a "dgain(200 ~ 700)" text box. The rfgain and dgain text boxes are highlighted with red rectangles.

6. Description of backend settings. You can add two backend settings at the same time, such as pulsar + spectral line, but SETI and pulsar or spectral lines cannot be selected at the same time.

The screenshot shows the "Backend Configuration" panel. At the top, there are checkboxes for "PSR" (checked), "SPEC" (with a dropdown set to "SPEC(F)"), and "SETI" (unchecked). Below this, there are two sections: "PSR Backend" and "SPEC(F) Backend". The "PSR Backend" section has four dropdowns: "Beam" (M01), "Pol" (2 pol), "Channel Number" (1024), and "Sampling Time(us)" (8.192). The "SPEC(F) Backend" section has three dropdowns: "Beam" (M01), "Pol" (4 pol), and "Sampling Time" (0.1s).

7. Description of noise injection module. There are two modes: Modulate and On. If the Modulate mode is selected, the parameters set by the system can be added or manually added by the user. The noise injection time setting can be added by clicking once under "Add Noise Injection Time Range". If no noise injection period

is added, the default observation start time of the Modulate mode is injecting noise at start time. Users can flexibly add the noise injection time according to their own needs. If no setting is entered, there will be no noise injection by default.

Note 8: The start time and end time of injection noise are set according to the total application time. For example, the total application time is 3600 seconds (1 h), and the user needs to set up the noise in the first three minutes and the last three minutes:

Noise mode	Start time	End time
on	00:00:00	00:03:00
off	00:03:00	00:57:00
on	00:57:00	01:00:00

Noise Injection Time

Choose Noise Mode

Modulate

Intensity

high

Setup

Default-0.2s

Delay

0

Period(second)

0.2

On

25165824

Off

25165824

On

Add Time Range

Noise Mode

modulated

Start Time

00:00:00

End Time

00:03:00

Delete

Noise Mode

off

Start Time

00:03:00

End Time

00:57:00

Delete

Noise Mode

modulated

Start Time

00:57:00

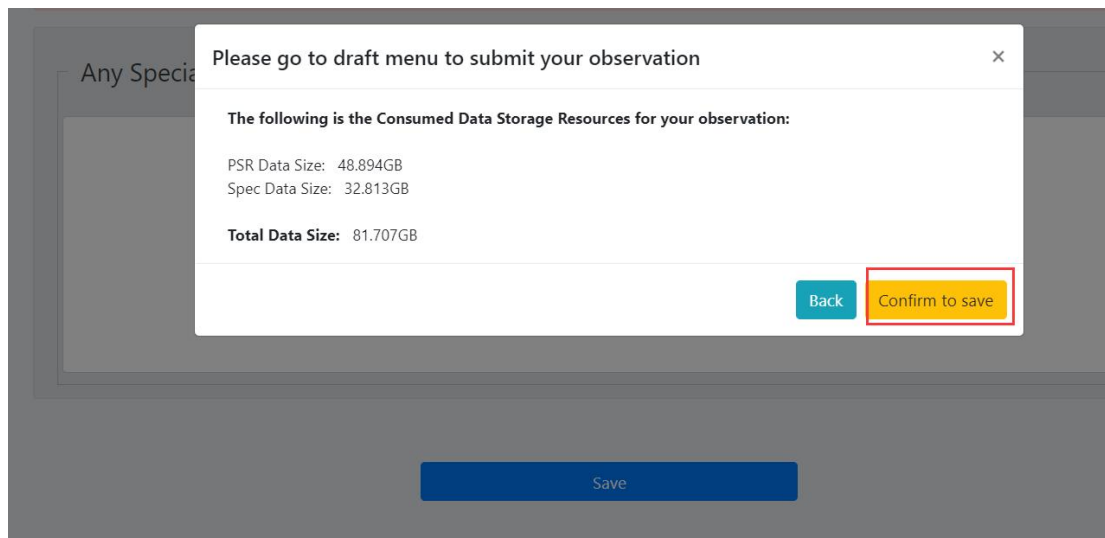
End Time

01:00:00

Delete

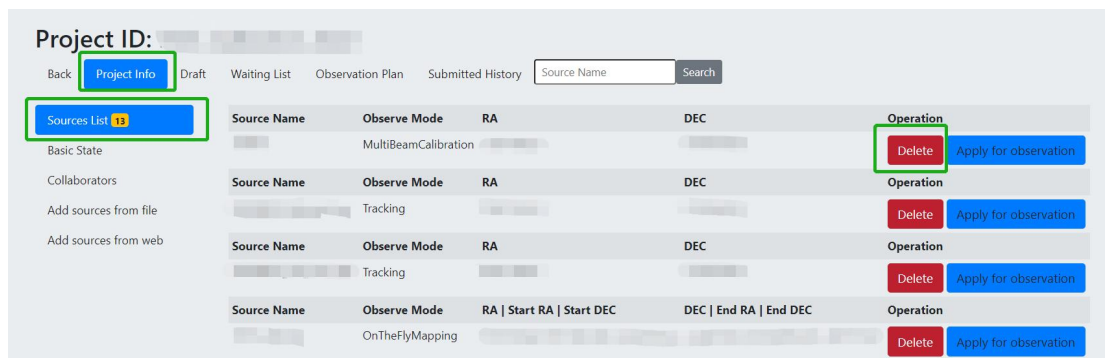
8. Special Instructions. If you have special requirements, you can leave a message in this module, and then click "Save" button. A prompt box for the size of the observed data of this source will appear. Click on "confirm to save" button, and the source will be transferred to "Draft" page.

Any Special Instructions?

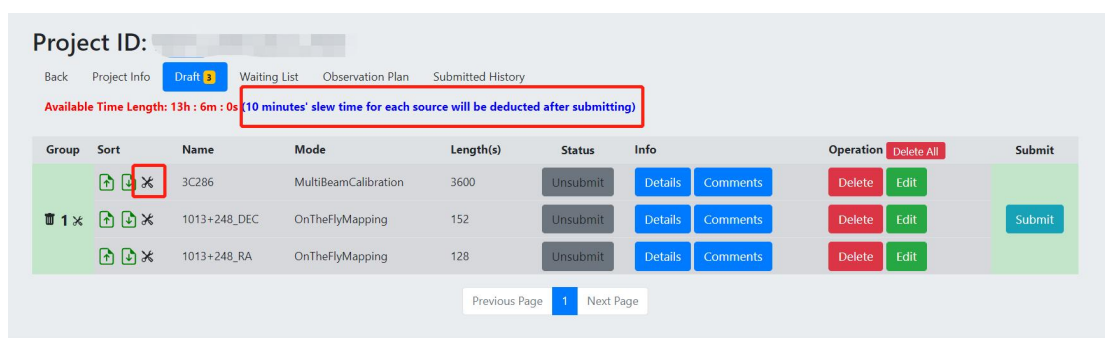


9. Before submitting the observation parameters in the "Draft" page, users should carefully check the settings of each parameter before submitting, and can modify and delete them before submitting.

Note 9: If you click the "Delete" button in the source list on the "Project Information" page, the source cannot be recovered and the source will disappear from the sourcelist. You can only contact the observation planning group to upload the source again and then set the parameters and submit again.



Note 10: If several sources are set to the same group number accidentally during parameter setting, you can click the tool icon in front of each source in the "Draft" page and modify the group number. As shown below, to modify the group number of the source.



10. Submit. Users can view the allocation of submitted sources in real time under "Waiting List", "Observation plan" and "Submitted History" tab.

11. Search Observation Log. After the observation is completed, you can click "Search observation Log" in "My Home Page", enter the project number to view the observation situation, and you can see the observation status of the source. Click "View Details" to learn about the actual parameter setting and problems occurred during observation. PI and CO-I can only see observation logs of their projects and observation logs of other open data sources.

[illegible]

FAST

NewsPublicationsTelescope PerformanceObservationData CenterHelp

SearchSearch

中文

Observation Logs

Source Name

PID

Date

Observation Mode

Search

Reset

Observe Date	PID	Observation Start	Source Name	Observation Mode	RA	Dec	Backend	Status	Operations
2021-09-10		2021-09-10 23:29:00		OnOff			spec_(W+N)	Failed	View details
2021-09-10		2021-09-10 22:57:29		MultiBeamCalibration			psr spec_(W+N)	Successful	View details

If you have any technical problems, please contact the observation planning group!
(fastobs@nao.cas.cn)