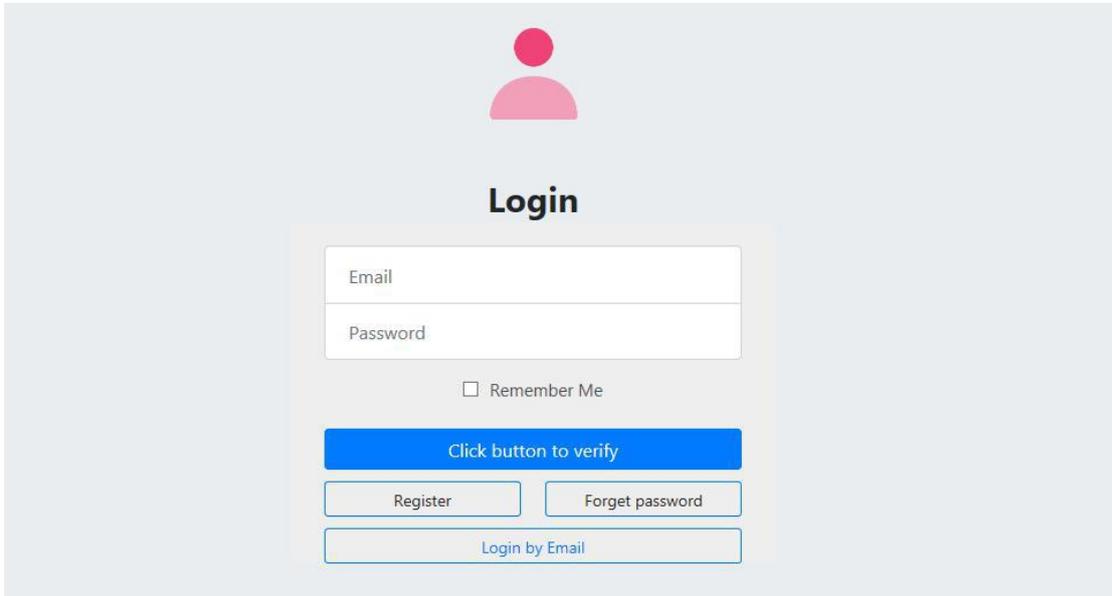


Operation instructions for submitting observation parameters

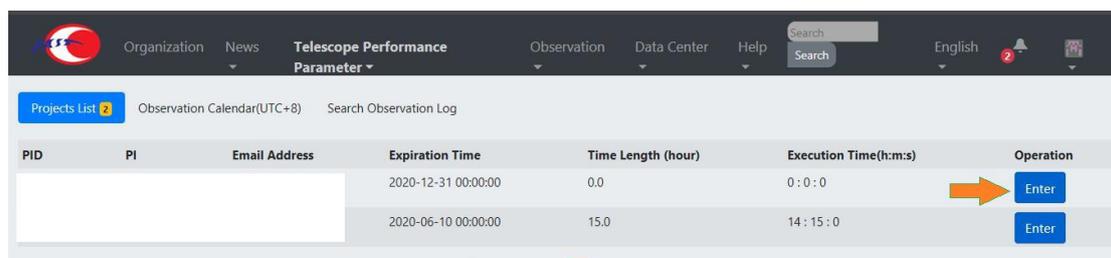
Website address: <https://fast.bao.ac.cn/> You can choose English or Chinese version.

1. Register. Please at login position to register. Log in again, need email number and password, "Click button to verify" login.



The screenshot shows a login page with a pink user icon at the top. Below it is the word "Login" in bold. There are two input fields for "Email" and "Password". A checkbox labeled "Remember Me" is below the password field. A large blue button labeled "Click button to verify" is prominent. Below it are two smaller buttons: "Register" and "Forgot password". At the bottom is a button labeled "Login by Email".

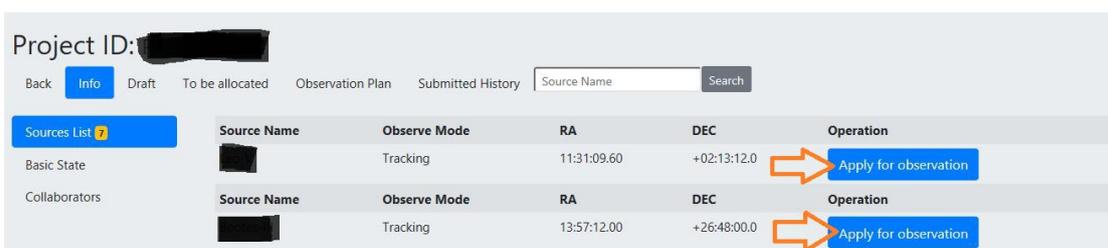
2. After logging in, you can see your own project information.
3. Fill in the observation parameters required for the project. Users can see the overall project information, and fill in the observation parameters through "Enter".



The screenshot shows a table with columns: PID, PI, Email Address, Expiration Time, Time Length (hour), Execution Time(h:m:s), and Operation. There are two rows of data. An orange arrow points to the "Enter" button in the Operation column of the second row.

| PID | PI | Email Address | Expiration Time | Time Length (hour) | Execution Time(h:m:s) | Operation |
|-----|----|---------------|---------------------|--------------------|-----------------------|-----------|
| | | | 2020-12-31 00:00:00 | 0.0 | 0 : 0 : 0 | Enter |
| | | | 2020-06-10 00:00:00 | 15.0 | 14 : 15 : 0 | Enter |

4. The filling page includes: basic information, Draft, To be allocated, Observation Plan and Submitted History. Enter the parameter setting page by "Apply for observation".



The screenshot shows a project parameter setting page. At the top, it says "Project ID: [redacted]". Below that are tabs: "Back", "Info", "Draft", "To be allocated", "Observation Plan", and "Submitted History". There is a search box for "Source Name". Below the tabs are two tables. Each table has columns: "Source Name", "Observe Mode", "RA", "DEC", and "Operation". An orange arrow points to the "Apply for observation" button in the Operation column of the second row of the second table.

| Source Name | Observe Mode | RA | DEC | Operation |
|-------------|--------------|-------------|-------------|-----------------------|
| [redacted] | Tracking | 11:31:09.60 | +02:13:12.0 | Apply for observation |

| Source Name | Observe Mode | RA | DEC | Operation |
|-------------|--------------|-------------|-------------|-----------------------|
| [redacted] | Tracking | 13:57:12.00 | +26:48:00.0 | Apply for observation |

Note 1: For the OnTheFlyMapping and MultiBeamOTF observation model, users need to add the start and end scanning time according to the size of the scanning area. 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: $300*4+3*20=1260s$.

Note 3: For onoff observation mode, users need to set the time of on source and the number of observation cycles.

5. Parameters page includes: Information, Observation Time, Basic Configuration, backend Configuration, and Noise Injection Time 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 divided into 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: 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 plan arrangement group.

6. Description of backend settings. You can add two backend settings at the same time, such as pulsar + spectral line.

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 injection noise start time. Users can flexibly add the injection noise time according to their own needs. No setting, no noise is injected by default.

Note 6: 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 |

8. Before submitting the observation parameters in the "Drift" module, users should carefully check the settings of each parameter before submitting, and can modify and delete them before submitting.

9. Submit. Users can view the allocation of submitted sources in real time under "To be allocated", "Observation plan" and "Submitted History".

Note 7: If you have special requirements for zenith angle, you need to explain it to the observation plan arrangement group; if you have any technical problems, please contact the observation plan arrangement group!

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