PFS science operation concept of open-use programs

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0. Outline

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2. Time line (example)
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5. Ideas for the use of unused fibres
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1. Goal of PFS science operation

- Efficient use of observing nights
- Maximise scientific output
- Provide opportunity for important science with an underused multiplex

2. Time line (in the case of S21B)

When	What
Feb 2021	Call for proposals
Mar 2021	Submission deadline
April-June 2021	TAC/Scheduling
Aug 2021 -- Jan 2022	Semester S21B
A night	Observation, initial QA (IQA)
+ < 2 business days	Final QA (FQA)
+ ~2 business weeks	Data reduction, delivery

3. Proposal submission

Subaru Telescope	PI
Call for Proposals	Default mode is the **queue mode**
Proposal application form and submission system	Request observing time in **hour basis** with a target list
Exposure time calculator	Set **seeing** and **transparency** constraints
Fibre allocation software	
Duplication checker	Check any duplications and simulation of fibre allocation
	A separate category for bad weather projects

4. Proposal selection and time allocation

TAC	Subaru Telescope	PI
Rank proposal to determine primary pointings cf. Grade A/B/C/F in HSC queue mode with Grade A being carried over 2 more semesters	Scheduling based on the primary pointings Ask PIs Phase 2 submission Provide Phase 2 form and submission system	Phase 2 submission by making Observing Blocks (OBs)

5. Ideas for the use of unused fibres (filler targets)

- There may not be enough objects to fill PFS FoVs with highly ranked targets

1. **Make a second call at the primary pointings.** Pointing centres and requested observing conditions will be public.

2. **Call letters of intent for long-term filler projects** separately. Here, fillers must distribute relatively uniformly (e.g., magnitude-limited sample) and have a potential to become legacy data.

6. Night observation concept

- **Subaru Telescope** carry out PFS runs in **queue-mode** from the beginning as default

  [Minimum] **No mixture of open-use programs per pointing but fillers**

  [Ideal] **Fibres are shared by multiple programs** (incl. SSP)

- **PIs submit target lists** with *priority, exposure time, seeing, and transparency* for the pre-defined pointing centres

- **Subaru Telescope** will carry out day time queue planning

6. (cont.) Night observation flow

1. Run the queue scheduler to **select best possible pointing** with given observing condition

2. Run exposure targeting software (ETS) to **configure fibres** using a combined target list

3. Science exposure

4. Repeat exposure (→3) / Rewind (→2) / Move to a different target field (→1)

5. Run the **on-site analysis** system to derive diagnostics parameters (e.g., seeing and transparency)

6. Initial **quality assessment** (IQA; seeing, transparency, and fibre positioning)

6. (cont.) Calibration data acquisition

- Most of calibration data will be **taken in the morning** (and maybe the evening in the following nights) because exact fibre configurations have to be known

- Telescope needs to be released for day crews by 7am

- Current estimate is **5 min per configuration**

- Night observing time may be reduced if too many configurations are requested

7. Post observation flow: QA and data delivery

1. **Final QA (FQA; validation of IQA) for raw data** within a couple of business days

2. **Centralised data reduction** by the observatory

3. **QA for the reduced data** (calibrated 1D spectra)

4. **Delivery of the reduced 1D spectra** with QA parameters

8. Discussion items (observing mode)

- Are there requests on offered observing modes?
- Example:
  - Different exposure times for different arms (blue, red, and IR)
- Dual-beam switching mode
- Classical mode observation

8. (cont.) Discussion items (policies)

- Filler call and its selection policy
- QA policy for reduced data
- Archive policy for reduced data
- Raw data delivery policy
- Fibre allocation policy for unused SSP fibres (if any)
- Fibre assignment and data delivery policy for the case of duplicated targets