

Disruptive vs. Non-disruptive Target of Opportunity Observations

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ABSTRACT

This report describes the different scheduling timelines for disruptive and non-disruptive Target of Opportunity observations.

Introduction

Two types of Target of Opportunity (ToO) observations can take place on HST: disruptive ToOs and non-disruptive ToOs. The distinction between the two is based on the turn-around time - the time between the activation of the observation, which includes the submission of an appropriately updated Phase II proposal, and the actual execution of the first observation of the activation. See the HST *Call for Proposals* for policies regarding ToOs.

Scheduling Process

The Principal Investigator (PI) of a ToO program activates a ToO observation whenever an appropriate triggering event occurs (e.g., discovery of a supernova or a gamma-ray burst). A new Phase II proposal usually needs to be submitted, at least to supply the coordinates of the newly discovered target. The new observation needs to be processed in the HST ground system and reviewed by an instrument team before being scheduled on the spacecraft. See http://www.stsci.edu/hst/scheduling/activating_toos for information on activating a ToO observation.

Disruptive ToO

A disruptive ToO needs to be executed on an existing HST observing schedule. HST observing schedules are 7 days in duration, starting at 00:00 UT each Monday (7:00 PM EST Sunday). These schedules begin building on Thursdays, 11 days earlier. At any one time, up to 3 HST observing schedules can exist: one executing and one or two building. Revising any of these for a new observation is considered disruptive.

Revising an executing observing schedule for a ToO observation requires a spacecraft intercept, which is highly disruptive and requires extensive work by the HST operations staff. The minimum turn-around time is 24 hours if all conditions are ideal. In practice, a 36-48 hour turn-around time should be expected. These ultra-rapid turn-around ToOs are limited to one or two per cycle.

Revising an observing schedule that is in the building process for a ToO observation also requires extra work by the operations staff. These are also considered disruptive ToOs and are limited to a small number each HST cycle.

Non-Disruptive ToO

A non-disruptive ToO does not need to be executed on an existing HST observing schedule. While this type does not interfere with the short-term scheduling of HST, a large number of these can have an adverse effect on the HST Long Range Plan.

The shortest turn-around time for a non-disruptive ToO activation is 13 days, but can be as long as 25 days, depending on the day of the week of the activation, due to the building process. As an example, consider a ToO activation and Phase II submission occurring on Tuesday, June 1, 2010. The observation would be processed and reviewed on Wednesday, June 2, and ready for inclusion on the schedule being built on Thursday, June 3. This schedule covers the week of June 14-20. The observation may be executed as early as June 14 (13 days after activation) or as late as June 20 (19 days after activation) and would be considered non-disruptive. Most non-disruptive ToOs execute more than 3 weeks after activation.

However, if the ToO activation and Phase II submission occurred on Wednesday, June 2, the new observation may not be processed and reviewed before scheduling activities begin on Thursday morning, June 3. In that case, in order to be considered as non-disruptive, the observation would be held a week, then included on the next building observing schedule, which would execute June 21-27, 19-25 days after the activation.

Final Note

Target of Opportunity observations are a limited resource in HST observing. The HST Time Allocation Committee (TAC) allocates a specific number of activations of each ToO observation type for each observing cycle. PIs are not permitted to reallocate TAC-awarded ToO observation types, so proposers should carefully consider the number and type of activations their program will require.