

HET Users Committee Recommendations on Enabling Dark-Time User Programs

Background: The HET Users Committee (UC) strongly supports HETDEX, and eagerly anticipates the exciting and important new scientific results to come upon completion of the survey. The UC is especially pleased to see that HETDEX is still on track to complete the survey in 2024-2. In order to ensure the timely completion of HETDEX, the HET Board has dedicated virtually all of the “extragalactic dark” observing time (moon below horizon) to HETDEX. The HET Board allocates HETDEX time at Priority 0. Thus, the only way for partner time allocation committees (TACs) to interrupt HETDEX for high priority user programs is to use their Priority 0 time as well.

A significant number of HET non-HETDEX users would like to exploit the 10-m aperture and cutting-edge instruments for *exciting new scientific programs* in dark time. Many of these involve observations at high galactic latitudes in the spring. For the next two years, these areas are not accessible except via P0 HETDEX interruptions of HETDEX. But this P0 time is quite limited, and is used not only for targets in conflict with HETDEX, but also for time-critical and synoptic observations (such as planet transits) and for target-of-opportunity and transient event follow-ups. TACs had needed to resort to allocating P1 time to targets in conflict with HETDEX. We note that the completion rate of P1 observations lags the other priorities and this can be directly traced to having too much competition for dark time observations at the periphery of the HETDEX footprint. The TACs are allocating time to high value dark time projects, but they are not succeeding. This has made it very difficult for partner users to obtain pilot or proof-of-concept observations that can be used *now* to secure external grant funding for new HET programs to be conducted in the post-HETDEX era. Even a little bit of additional spring dark time for non-HETDEX programs would be extremely valuable – especially for junior faculty.

The actual level of HETDEX “interruptions” for science, engineering, commissioning and GTO observations is often given in the end-of-trimester reports. Small blocks of time that could not be utilized by HETDEX for other scheduling reasons are also included. All these amounted to a total of 15.1% in 2020-2 (the most recent report for which this value is given). *Some* of this is due to TAC-allocated P0 interruptions, but a large part is also due to a wide variety of other situations, such as observing conditions not fully suitable to HETDEX, or when a full HETDEX observing sequence could not be scheduled. The actual level of P0 science program interruptions has been running around 5% of HETDEX allocated observing time, rather than the 10% that should be allowed.

There has also been discussion about the increasing number of HETDEX “holes” that will occur as HETDEX reaches its spatial coverage requirements in some of its area. However, HETDEX “holes” are a rather nebulous concept. At present, in the high declination spring fields with long track lengths, HETDEX can almost always find an observable field at any time when the moon is down and the HETDEX field is available. This is because HETDEX has a requirement for total sky area covered, but not necessarily for the detailed pattern of coverage within the HETDEX field and does not require full coverage.

The Users Committee sees an opportunity to provide more access for dark time high priority non-HETDEX science, while not impacting HETDEX completion.

Recommendations:

1. The TACs should continue to allocate P0 time to darktime projects with the intent of interrupting HETDEX observations for these partner science programs.
2. We propose that the total of TAC allocated P0+P1 time remain at 33.3% of each partner time, but the division between the priorities be changed from 8.3% P0 25% P1 to 13.3% P0, 20.0% P1, until completion of the Board-guaranteed HETDEX time.
3. HET partner institution TACs will be given *guidance* but *not a mandate* that the intent of this increased P0 allocation is for enabling dark-time programs that are now prevented by HETDEX. But the TACs will still be guided primarily by scientific merit and by time demand. They may allocate their P0 time *as they feel is best*. We do *not* plan to implement different “flavors” of P0 time. Once allocated, all P0 time is treated equally by the HET night staff in scheduling.

We will need to communicate these changes to all current and potential partner HET users and TACs, so that new programs taking advantage of this opportunity may be proposed, and the Users Committee will help ensure this opportunity is well advertised. Currently, there is a class of observation that is not being proposed due to target collisions with HETDEX, which will be enabled by this modest change in the allocation of P0 time. The overall goal is to test and enable new scientific uses of HET during dark time in the coming post-HETDEX era, and thereby maximize the scientific impact of the HET.