HTOPX II:

A New Query Engine for HET

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Over the course of ten weeks at McDonald Observatory, I have created a

replacement for the HTOPX (HET Top Priority Targets, Experimental) Program which is used by the resident astronomers at the HET to sort through the long list of targets in the queue of requests from different universities. This program aids in the efficiency of observing.

The HTOPX program consists of a database, and a GUI front-end for analyzing objects in the database. In the old HTOPX, the "database" was an ASCII file called plan.db and the front-end GUI was written in TickleTK. There were several problems with the front-end as well as the ASCII plan.db. First, the front-end had several efficiency issues. For example, setting constraints on the objects retrieved from the database was a matter of checking or unchecking boxes containing values across the spectrum of possible values from the database, including numerical values. Second, the database, as well, had several efficiency issues. In order to change information about one object in the database (for example, incrementing the number of times an object has been observed), would require re-writing the entire plan.db file.

The proposed solution to the HTOPX woes consisted of, first, a MySQL replacement for the plan.db ASCII file, and second, an interface capable of interacting with a MySQL database and allowing the resident astronomers at HET greater flexibility for deciding which objects to observe when. The chosen method for creating this interface was to implement the capabilities of the wold wide web: HTML, PHP, JavaScript, and CSS (Cascading Style Sheets). PHP comes with MySQL functionality, and with the aid of CSS and JavaScript, it has been easy (relatively easy) to create a portable, versatile, and superiorly interactive interface. The new HTOPX interface has many advantages over the old one. First, a color coding system alerts resident astronomers of the priority and position (relative to the HET track, the line in the sky where the object is within the range of the HET) of the objects which are in their query result list. Second, CSS allows for menus to appear on mouseover events, and this saves window and desktop space because several extra windows to control the database query do not need to be opened, and long lists of criteria in HTML forms do not have to be sifted through to find one variable that needs to be changed. Third, a feature to save and load query settings is also available.

The new HTOPX works largely with PHP's session variables. The program consists of three main web pages in a frames setting. The large window is used to display, in tabular form, the results of queries to the MySQL database, which I will explain later. Within these tables are nested menus, which appear on the mouseover event on the names of each object displayed on the table. The window on the right

consists, so far, of five drop-down menus where query settings pertaining to sky conditions, object program (related to the university from where the object was requested), instrument settings, object status (whether or not the object is on hold, for example), and sorting options. The top window consists of other query settings, however these pertain to what the resident astronomers told me were the most important settings, such as priority filtering, and filtering based on sky position relative to the HET track.

Both of these menu pages has its own processing page, which is opened when the forms on these menu pages are submitted. This processing page takes the posted variables and turns them into session variables. These session variables are interpreted by the table page, when it reloads, and are put into a MySQL query, the results of which are displayed in the table.
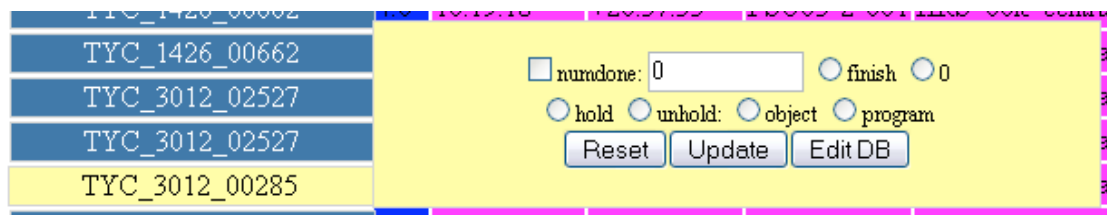
This new HTOPX effectively replaces the old HTOPX, and provides a much more versatile interface for the resident astronomers at the HET.
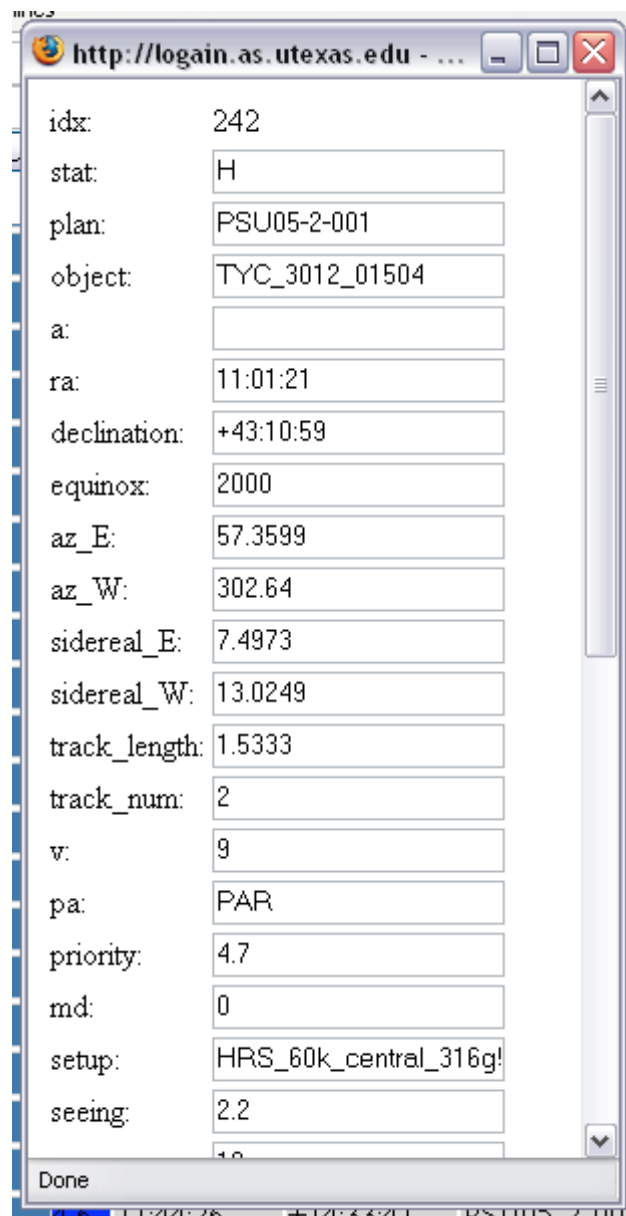
The new HTOPX (HTOPX II)

The names of objects (the first column on the table) are, in fact, menus in themselves.

These menus provide a collection the most essential options for updating single objects in the database. In addition, the "Edit DB" button will open up a window in

which the user is able to edit any property of the object.

There still remains some work to complete HTOPX II, and to implement it as a replacement for the old HTOPX, however, on the whole, I feel like this project has been a complete success.