

There are three methods for offsetting the HET tracking sphere. These adjust focus, tip/tilt (on sky), and redefine the Ideal Tracker Frame (ITF) zero point. The commands are `offset_focus()`, `offset_sky()`, and `offset_itf()` respectively. This document describes these commands and their behavior in and out of the context of an active trajectory.

Each of the offset methods adds a given delta, or set of deltas, to any prior deltas, for that particular offset. Accumulated offsets are applied to each subsequent trajectory point sent to the tracker and persist from one trajectory to the next. If the system is not on trajectory when the offset is applied, the tracker is moved to compensate for the requested offset. Move commands issued after offsets have been set only include the initial ITF offset set in TCS at compile time (or by configuration). That offset is the zero point for all offsets issued through the commands described here. These offset methods are independent of both the `offset_trajectory()` method, which moves a trajectory along the current tracking sphere, and the metrology loops, which perturb the same parameters and will contend with all but `offset_focus()`. The primary mirror Distance Measuring Interferometer (DMI) Loop will be adjusted to account for each `offset_focus()` call.

Though drawn in parallel in the diagram below, each of the offset operations is atomic and any moves resulting from an offset are constrained to include only that particular register's instantaneous change. This diagram captures several realizations and should be interpreted, for a single clocking, as one of the following scenarios:

1. A trajectory point p_{ITF} is mixed with the current offsets and mount model then sent to the tracker.
2. A move to p_{ITF} is mixed with the mount model and sent to the the tracker.
3. One of the offset commands adds an offset to the corresponding register and, if not on trajectory, issues a move command to account for the resultant change to the tracking sphere.

