# Software Management Plan for TiDES WP3.7 Phase C

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## What software will you develop?

* We will develop software that will allow the in-kind recipients to communicate transients for follow up observation with TiDES.
* This software will build on the existing infrastructure from Phase B – WP3.3 D3.3.4
* Our software will continue to interface with the updates to the 4MOST API for real-time candidate ingestion.
* DESC intend to develop their own broker service for their candidate selection stream, the TiDES software will interface with this product.
* We will develop software to ingest Strongly Lensed sources for the 4SLSLS team to interface with 4MOST.
* Were appropriate, our code will conform to the PEP8 standard.
* Software is being developed by a single author but will undergo code review following LSST:UK standard procedure.

## Who are the intended users of this software?

* Members of the TiDES/LSST:UK collaborations and the in-kind recipients DESC+TVS are the intended audiences. Although it is expected that the software will be developed by TiDES, launched once, and will then run in the background during survey operations with an interface for select members only (either through a GUI or command line).
* Other users would include those who will maintain and update the software during its lifetime.
* Users of the software will be expected to have familiarity with Python and the Lasair API. Additionally, command line skills will be essential to maintain the backend of the software.
* The software will be developed using the anaconda package manager, conda virtual environments, and hosted on a remote server running a Linux virtual environment.

## How will you make your software available to other users?

* A Github repository will be created within the LSST-UK organisation. [https://github.com/lsst-uk/tidesPhaseC]
* All source code will be available on Github.
* We do not expect many people download and run our software due as we will be running the software in a virtual machine and providing the output.
* Updates will be pushed to the Github repo.
* This work will be distributed with an Apache 2.0 license.
* Packaged and released through relevant distribution tools such as PyPi/pip

## How will you support those who use your software?

* Installation instructions, use-cases, and examples will be presented in online documentation.
* The set of function, module, and classes will contain docstrings will detail everything a user needs to know.
* As we expect the software to only be used by TiDES/LSST-UK, in person support will be available from the development team via Slack.
* Users can ask for help by launching a Github issue in the repo. All questions, responses and issues will be publicly available.
* Technical notes and journal papers (if relevant) will be published to support the software products.
* A test suite of examples will be provided for future releases of software to ensure users can run the software.
* Private documentation will be provided to users of the Somerville virtual machine that hosts our software. This will include instructions on how to log in and reboot all the services in the event of a failure of the machine or maintenance downtime.
* Given that the current licence for our cloud-hosted Prefect system is limited to 3 users, we will ensure that there are at least 3 people in TiDES with admin access to this service.

## How will your software contribute to research?

* 4MOST/TiDES is the largest spectroscopic follow up survey of transients and their host-galaxies from LSST. The TiDES collaboration focusses on three key science goals: i) mapping the diversity of the transient phase-space, ii) curating the largest sample of Type Ia SNe and their hosts for the most precise SN cosmology measurement, iii) Performing the largest AGN reverberation-mapping experiment to-date.
* To achieve each of these goals, transient phenomena need to be reliably identified in the LSST high-bandwidth data streams in real-time. This piece of software will do just that and will enable all the downstream science that follows.

## How will your software relate to other research projects?

* Our software interfaces with Lasair and will enable 4MOST/TiDES to collect spectroscopic observations of transient sources. This data will eventually be made public. There will be numerous other research projects that will spawn from this data feed we enable.

## How will you measure your software’s contribution to research?

* We will ask users of any TiDES data to cite our TiDES survey paper and any other relevant papers published detailing our software products.
* TiDES will also create a survey website which will link to the TiDES survey paper and publications. Data Releases will also be announced on this site.

## How will you deposit your software to guarantee its long term availability?

* Our software will be hosted in a Github repository. Given the scale of Github’s service and the many other important pieces of research software hosted there, we expect this to be a long-term solution for hosting.