PyTransit Package

[1] **PyTransit: Curving Light to your Liking**
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[2] PyTransit package is a package that facilitates the creation and analysis of light curves of exoplanets or other transit objects. It also offers an object-oriented Python interface with different types of modeling to model lightcurves. In addition, the models can evaluate multicolour observations, transmission spectroscopy, built-in supersampling to account for extended exposure times, and routines to calculate the projected planet-to-star distance for circular and eccentric orbits, transit durations.

[3] I picked this package because I am interested in exploring lightcurve tools in Python. Additionally, getting started in learning this package could be helpful if I need to plot transients for future courses and possibly careers.

[4] PyTransit was first developed in 2009 by Hannu Parviainen.According to PyTransit github page, there are two other contributors who worked on the package, Luca Borsato and Shashank Dholaki. There were other lightcurve modeling tools that came before this package, but they were in other programming languages. However, there is another Python package that does model lightcurves of exoplanets called PyLightCurve, but it was released much after PyTransit.

[5] PyTransit is still being maintained by the original author. The latest version was released on April 7, 2025. As far as I know, there are no instructions to contribute to the project and there are no open projects.

[6] It is very easy to install the package and use the package, all you need is one line of code to install the package. To install the package, you need to run the ‘pip install’ command, so you would need to write ‘!pip install pytransit’.

[7] PyTransit is installed by “standard” pip/conda.

[8] The source code of PyTransit is available online on their github page. It is under their pytransit folder and from there you could see multiple folders containing their source codes for the different modeling and more.

[9] To the extent of my knowledge, there are no other packages that uses PyTransit.

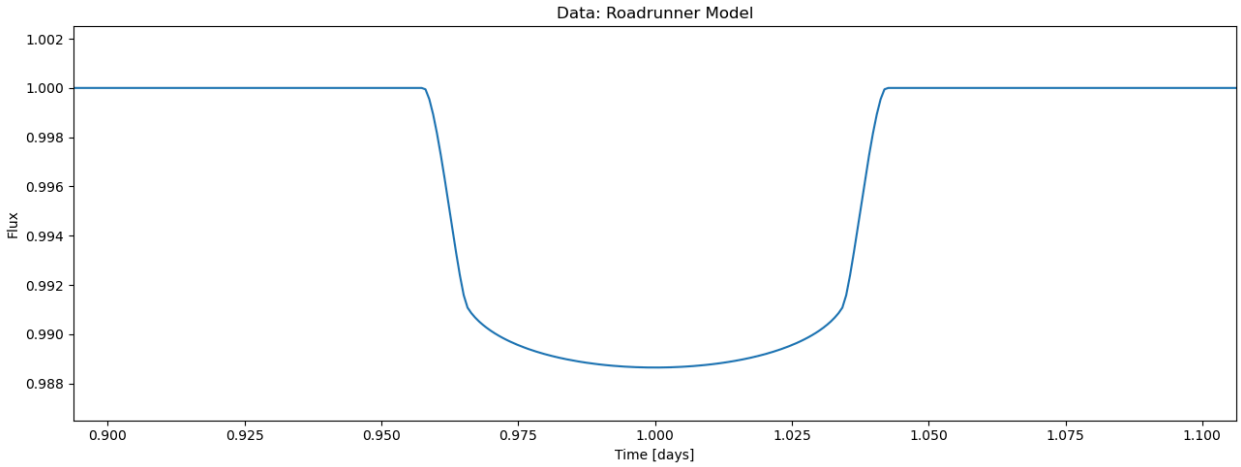
[10] PyTransit is mainly used through jupyter notebook, but there are parts that is used through Python scripts.

[11] Here are some example code of PyTransit. PyTransit has many models available, so you would need to import specific models when importing from PyTransits. The following code is for importing and initializing the QuadraticModel of PyTransit:

```
from pytransit import QuadraticModel
tm = QuadraticModel()
```

[12] The package does not produce figures on its own. The figures are produced with the help of matplotlib.

[13] Here a lightcuvre plot of the data provided by the author. This lightcurve plot uses the PyTransit RoadRunner modeling.



[14] According to PyTransit github page, the package is not pure Python and is accompanied by C for a small portion of the code.

[15] The input of the package are parameters, dataset(s), and can be generated from scratch.

[16] The output of the package is a screen output that needs to be captured.

[17] The code does not provide any unit test, regression, or benchmarking.

[18] To feel confident of the code, you could run a standard benchmarking command to see how the code is running and rather it is producing the expected results. You could also run some of the examples provided by the author to test and verify the modeling used in the package.

[19] The main Pythons packages PyTransit depend on are numpy and matplotlib. I found this out by looking at the source code and example codes.

[20] PyTransit does provide documentation through readthedocs.io, with the link to the page here: https://pytransit.readthedocs.io/. The documentation was sufficient enough for me and provided the basic information about the package, along with some example codes.

[21] Preferred citation method: https://ui.adsabs.harvard.edu/abs/2015MNRAS.450.3233P

[22] Other References:
PyLightCurve: https://github.com/ucl-exoplanets/pylightcurve#pylightcurve
Anaconda: https://anaconda.org/conda-forge/pytransit

[23] Papers that used this package:
https://ui.adsabs.harvard.edu/#abs/2024ApJS..275...32Z/abstract
https://ui.adsabs.harvard.edu/#abs/2024PASP..136h5001C/abstract

There are a total of 170 papers that cited PyTransit:
https://ui.adsabs.harvard.edu/abs/2015MNRAS.450.3233P/citations.

[24] I didn't really need to learn new Python to use this package. I understand most of the example code provided and I was able to test and use the package. I did notice the package access numpy and matplotlib by using a ‘pylab inline’ and ‘matplotlib inline’ command rather than the typical imports methods.

[25] I had no prior experience in using this package and I worked alone for this project.