

Exoplanets Transit Timing Variation and Transit Duration Variation Catalogue from TESS

Exoplanets are planets that orbit around other stars outside the solar system. One of methods that can be used to locate them is transit method. In transit method, the variation of the flux from the host star is observed when the planet passes in front of it. There are periodic dips with a period equals to the orbital period in its light curve where the time between ingress and egress is called transit duration and the middle point of the dip is called mid-transit time. However, the existence of third body in the system causes change in the time measurement for each transit because of the gravitational interactions. Therefore, there are variation in the transit durations and mid-transit time. In This project, TESS (Transiting Exoplanet Survey Satellite) raw light curve are used to perform curve-fitting and optimize transit parameters. Furthermore, the period of transit timing variation (TTV) is computed by Fourier transformation and false alarm signal for predict the existence of third body. Some host stars are primarily used to check the performance of our calculation such as WASP-126, which does not show the existence of WASP-126 c with false alarm signal 0.99, and TOI-216.01 and TOI-216.02 with false alarm signals around 0.

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