
Searching for transiting exoplanets in Gaia photometry

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Abstract

The ESA cornerstone mission Gaia was successfully launched in December 2013 and is currently residing in L2 and taking data. The primary mission of Gaia is of course to perform astrometry and radial velocimetry of approximately a billion stars in order to create a three dimensional dynamical map of the Galaxy. In the process of performing this task, Gaia will obtain photometry better than 3 milli-magnitudes on all stars with $V < 16$ and better than 1% for $V < 18.5$. This is sufficient for the detection transiting exoplanets. However, these data are distinctly different from those typically used for exoplanet detection, as each star will be observed only about 70 times, but for hundreds of millions of stars. While these characteristics present a variety of unique challenges, the potential for significant discoveries remains. Of particular interest is that fact that most of these stars will be red dwarfs, which are currently being focused on due to the relative ease with which terrestrial planets can be found in their Habitable Zones. I will discuss the nature of the data set, the nature of the challenges, the expected planetary yield, and what Gaia can do for future dedicated transit missions such as TeSS and PLATO.

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