

The probability of finding Earth-like planets that can not transit by its inclination.

The objective of this work is to determine the probability of finding Earth-like planets orbited around Sun-like star under the condition that its inclination is not appropriate for eclipsing. The method was done by analysis of the database of transiting planets discovered by NASA's Kepler Mission. We determined that Earth-like planet requires the following properties; Earth Similarity Index (ESI) in the range of 0.8-1.0 and remain in the system of Sun-like star which mass between 0.8-1.2 Solar mass, effective temperature between 5,000-6,000 Kelvin and spectrum type G0V-G9V. According to the database, there were 3 planets followed all of these conditions. Then calculate the inclination interval that is suitable for eclipsing of any planetary systems which has 1.0-2.0 Earth radius, orbited around 1.1 Solar radius star with 0.5-2.0 AU orbital semi-major axis. The results reveal that the inclination interval is 88.94-91.06 degree. Since the inclination of any planetary systems can be randomly occur, so that the ratio of the inclination that can be able to transit to all possible inclination is 0.01175. According to 3 Earth-like planets that followed all conditions, there are totally 255 planets which can be able to detect. So, there were 252 Earth-like planets which never found yet since their inclinations are not suitable for transit. Therefore the probability of finding Earth-like planets that can not transit by its inclination is 0.9882.

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