

P319c Earth through the looking glass: how frequently are we detected by other civilizations through photometric microlensing?

S. Suphapolthaworn (Hokkaido U.), S. Awiphan (NARIT), T. Chatchadanoraset (CMU Dem. School), E. Kerins, D. Specht (U. of Manchester), N. Nakharutai, S. Komonjinda (Chiang Mai U.), A.C. Robin (U. of Franche-Comté)

In principle, Earth's microlensing signal could offer the chance for other technological civilizations to find Earth across Galactic distances. We propose the "Earth Microlensing Zone" (EMZ), defined as the areas of the sky from which Earth's microlensing signal might most likely be detected by a distant observer. Using stellar parameters from *Gaia* DR2 catalogue, the probabilities and rates at which observers may discover the Earth through photometric microlensing for the entire sky are calculated. Although the Solar System is multiplanetary, we show that a binary lens assumption of the Earth and Sun adopted in the calculation can well describe the Earth's photometric microlensing signature. We found that, on average, a microlensing signal due to Earth comparable in size to those we detect from other planets, occurs tens per year towards any star in the Galaxy. In fact, the Earth seems to be very dark to photometric microlensing discovery by other observers, unless they have sensitivity well beyond our own present capabilities. Parts of the EMZ overlap with the Earth Transit Zone (ETZ) near the Galactic Center, which could be the main areas for future SETI searches.