

**Could You See an Earth-Type Planetary Transit of a Solar-Type Star?**  
**Another Use of TIM Data**

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The SORCE/TIM measures the total solar irradiance (TSI), integrating the spatial and spectral components of the Sun into a single intensity time series much as we might photometrically observe a star that cannot be spatially resolved. This instrument has very low noise, allowing the high-cadence data to clearly show solar variability even over short time periods; TSI variations of 100 parts per million (ppm) or more over a few minutes are not uncommon in the TIM record.

Given this high degree of short-term variability, how easy would it be to observe the transit of an Earth-type planet across a solar-type star, as proposed for potential future discoveries of small exo-solar rocky planets? Viewed from a great distance, our Earth would dim the light from the Sun by 100 ppm or less, comparable to natural fluctuations in the Sun's radiant output. I simulate a transit of an Earth-type planet using the high-cadence, low-noise TIM data to show the likelihood of detecting a transit in the resulting light curve.