Geophysical Research Abstracts
Vol. 14, EGU2012-12406, 2012
EGU General Assembly 2012

On the Habitability of Planets in Binary Star Systems

E. Pilat-Lohinger, S. Eggl, and M. Gyergyovits

University of Vienna, Institute of Astronomy, Geology,Geography and Astronomy, Vienna, Austria
(elke.pilat-lohinger@univie.ac.at, siegfried.eggl@univie.ac.at, markus.gyergyovits@univie.ac.at)

The discovery of more and more extra-solar planets in and around binary star systems cause questions concerning the determination of the classical habitable zone (HZ). We present calculations of the radiative and gravitational perturbations of two stars on a terrestrial planet moving in the HZ in different binary - planet configurations. Two types of planetary motion will be considered, i.e. S-type motion (or circumprimary motion) where the planet orbits one star only and P-type (or circumbinary motion) where the binary revolves inside the planet's orbit. It was found that the HZ in S-type configurations tend to be gravitationally dominated, the radiative input due to the second star is negligible compared to its dynamical influence causing secular changes in the eccentricity of the planets. This alters the amount of incident radiation significantly. In P-type configurations the radiation estimates can be determined on shorter time-scales. The radiation amplitude depends on the eccentricity of the binary in both configurations.
Finally we present time independent analytical estimates about the habitability of a terrestrial planet in the HZ of a binary star system as shown by Eggl et al.(2012).

This work was financed by the Austrian Science Fonds (FWF) P22603-N16 and AS11608-N16 and S.Eggl was financed by the University of Vienna (Forschungsstipendium 2012).

Ref.: Eggl, S., Pilat-Lohinger, E., Gerogakarakos, N., Gyergyovits, M. and Funk, B., "Habitable Zones in S-Type Binary Star Systems", ApJ, submitted.