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A NANOSATELLITE MISSION CONCEPT FOR OPTICAL SETI

Abstract

In view of recent discoveries of the significantly increasing number of extrasolar planets in possibly habitable zones and knowledge about extreme circumstances under which life could exist, it appears to be more and more likely that signs of life outside Earth could be detected soon. If and when this happens, the next logical question will be if intelligent lifeforms may exist and moreover if they are trying to communicate with other civilizations. Under these circumstances, the search for extraterrestrial intelligences (SETI) seems to be natural more than ever, although the search of more than 50 years in radio wavelengths has not delivered a positive sign yet.

One of the possible ways to study potential signals coming from intelligent extraterrestrial lifeforms can be to analyze the optical spectrum, which is usually called OSETI (Optical Search for Extraterrestrial Intelligence). OSETI is also already conducted by several institutions using ground-based facilities on Earth by using an array of photomultiplier tubes. But such observations are limited due to the atmosphere. Therefore, a possible way to overcome the disadvantage of the atmospheric influence could be the use of a dedicated satellite for OSETI in an earth orbit. Since such a satellite mission would be obviously very expensive, it is worth to be investigated if there is the possibility to reduce the cost of such a mission by utilizing a nanosatellite concept. In recent years, nanosatellites of the order of 1 to 20 kg have reached a high state of maturity and are becoming a more and more useful tool for several applications, ranging from communications to scientific experiments and observations.

The basic idea of this study is to answer the question if a dedicated nanosatellite could be used for OSETI. The study is conducted by the Interdisciplinary Research Center for Extraterrestrial Studies (IFEX) of the University of Würzburg.

The results of the study will be presented at the conference and described in a report.