Paper ID: 66467
student

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Interactive Presentations - IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (IP)

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BIOSIGNATURES OF LIFE IN EXOPLANETS

Abstract

The search for life across interstellar distances is a scientific challenge that pushes the boundaries of observational astronomy and requires careful consideration of the signs of life that we will best be able to detect. These signs are known as "biosignatures". The most useful biosignatures meet three criteria: reliability, survivability, and detectability, which together enhance the probability that the biosignature can be detected and interpreted as being due to life With these three criteria, Earth's abundant molecular oxygen (O2) has been identified as the strongest biosignature for terrestrial planets and was also initially thought to be straightforward to interpret as having a biological origin. Due to limited data in Earthlike exoplanetary science, common approach is to extrapolate knowledge from the Solar System and Early Earth to Earthlike exoplanets by assuming the Earth's size, development, biomass etc. then to perform a parameter study varying starplanet orbit, stellar spectrum, biomass emissions etc. to determine the effect upon habitability .We should also look into detectability issues related to atmospheric biosignature spectra such as band strength and uniqueness thus come up with roadmaps related to biosignature science in an exoplanet context. The details regarding the mechanisms of detecting the aforementioned biosignatures will be discussed in the paper.