

Would aliens know Earth is habitable if they had the same technology as us?

indianexpress.com/article/technology/science/alien-detect-technology-life-mission-9196583/

March 5, 2024



The researchers set out to answer whether the LIFE mission would detect signs of life if it was aimed at Earth. (NASA)

A new study has revealed that life is possible on Earth. Of course, that was never a mystery to begin with, but the researchers were setting out to answer an important question — could the planned LIFE (Large Interferometer for Exoplanets) space mission detect signs of life? They found that it could, by using the Earth as a test subject.

The proposed LIFE mission will position five small satellites in space close to the James Webb Space Telescope. This network of five satellites will together function as one large telescope that can pick up the thermal radiation of exoplanets (planets outside our solar system.) The spectrum of light from the radiation can be used to identify the composition of the planets and their atmospheres.

In the study published last week in *The Astrophysical Journal*, researchers investigated how well the LIFE mission could investigate exoplanets. They decided to treat our planet as if it was an exoplanet and saw if they could find “signs of life,” based on spectrum data.

They used data from a NASA Earth observation satellite and generated emission spectra in the mid-infrared range, which could be how LIFE will generate data.

An important consideration for them to work on was how a large space telescope would observe Earth from a large distance away in space. Because of the distance, the planet will appear to be a speck with no recognisable features. So the spectrum data will be averages that depend on the viewing angle of the telescope and how long it captures the light.

They considered three different scenarios — two views from the poles of Earth and one equatorial view. They focused on data recorded in January and July to account for variations that could happen because of seasons.

The scientists were able to detect concentrations of the atmospheric gases carbon dioxide, water, ozone and methane in the infrared spectra of the planet's atmosphere. They also found the data to suggest the occurrence of liquid water on the surface. But the evidence of ozone and methane were especially important because they are produced by the planet's biosphere.

The results of the research also mean that if there is a distant alien civilisation using telescopes to look at us, they will know the planet is likely to be habitable.

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