Secondary Technology Explanation

Remote Sensing Based on Fluorescence LIDAR

Can detect and identify a wide range of chemicals from a distance and in real time

NASA Goddard Space Flight Center has developed BILI, the Bio-Indicator Lidar Instrument, for remotely sensing or sniffing life on distant planets. The device can autonomously search for signs of life and analyze the atmospheric contents at the planet's surface from afar. This will help reduce the risk of contaminating samples by removing them from their origin. By scanning from afar, NASA will minimize the risk of skewing the detection results. BILIs measurements do not require consumables other than electrical power and they can be conducted quickly over a broad area.

Benefits:

- Detects and categorizes small levels of complex organic materials in real-time
- Detection can occur up to several hundred meters away
- No nonrenewable resources outside of electrical power are required

Applications:

- Remote Sensing
- Homeland Security
- Environmental Monitoring

Description of technology:

As originally developed, BILI is a new planetary astrobiology instrument based on a real-time technique of remote detection and categorization of organic compounds dispersed in the surface-level planetary atmosphere, leveraging the fluorescence lidar technology. Capabilities of this first planetary atmospheric bio-indicator survey instrument will dramatically increase the probability of finding signs of extraterrestrial life by performing atmospheric volume scans in a radius of hundreds of meters around the rover or lander. The Bio-Indicator Lidar technology employs real-time aerosol particle detection and categorization based on two physical variables: particle fluorescence and particle size.

Original source: https://technology.nasa.gov/patent/GSC-TOPS-168

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