Built into the MERTIS IR Spectrometer as part of ESA's BepiColombo Mission

Axetris Infrared Sources ready for take-off to Mercury

The BepiColombo Mission is being jointly planned between the European Space Agency (ESA) and Japan Aerospace Exploration Agency (JAXA). Axetris Infrared Sources are being used in the mid-IR spectrometer MERTIS that will be on-board the Mercury Orbiter

The BepiColombo Mission

Mercury is the smallest and least explored planet in our solar system. Studying Mercury's surface in order to understand its formation history is a major goal of the planned mission. The **Me**rcury **R**adiometer and **T**hermal Infrared **S**pectrometer **(MERTIS)** will be instrumental in mapping surface mineralogy, analyzing surface composition, and studying thermal effects on Mercury's surface.

Studying Spectra in the 7 – 14 µm Range

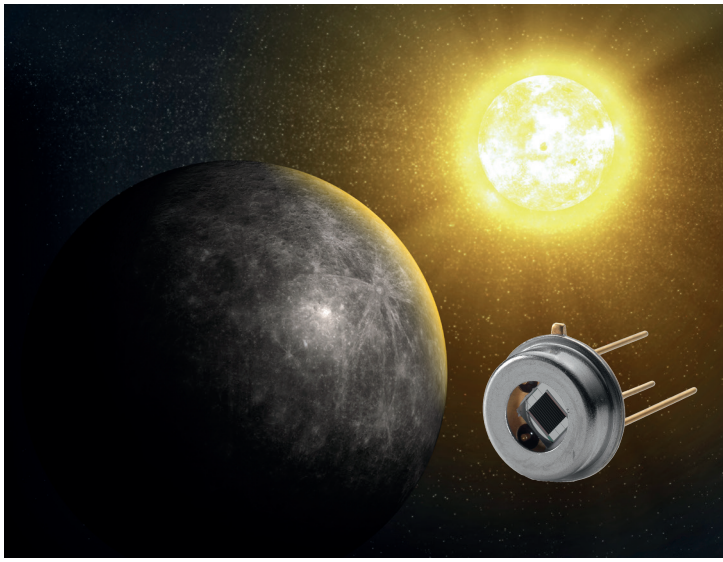
The IR spectrometer will operate in the 7-14 µm wavelength range for detecting elemental signatures of minerals such as feldspars, elemental sulfur, and other rock-forming minerals abundant on Mercury. The spectrometer is based on sequential emission measurements. A stable emission from a reference blackbody source (held at 700K / 427°C) is a prerequisite to attain the required spectral resolution.

Axetris MEMS-based Infrared Sources as Blackbody Emitters

The Electrically Modulated Infrared Sources (EMIRS200) from Axetris were chosen due to their black body emission characteristics. Long lifetime and emission stability are key strengths of the MEMS-based design.

The unique design of EMIRS200 is based on a resistive heating element integrated onto a thin dielectric membrane which is suspended on a micro-machined silicon structure. The sources are packaged in compact TO-39 cans and are available with protective cap or with reflector. They can be fitted either with Sapphire, CaF2 or BaF2 or Germanium windows.

EMIRS 200 from Axetris are now built into MERTIS, and ready for take-off to study one of the most intriguing planets in our solar system.



Axetris infrared sources will be part of the MERTIS Infrared Spectrometer on-board the planned BepiColombo Mercury Mission

Key Facts BepiColombo Mission / MERTIS

- Approximate 7 years flight time to Mercury
- Launch Mass 4100 kg
- Temperatures endured up to 350°C
- Operational Lifetime > 1 year after reaching final orbit
- Mercury Planetary Orbiter (MPO) will carry 11 instruments, one of which is MERTIS

Detailed information about the project and MERTIS can be found on ESA's website:
http://www.cosmos.esa.int/web/bepicolombo/mertis

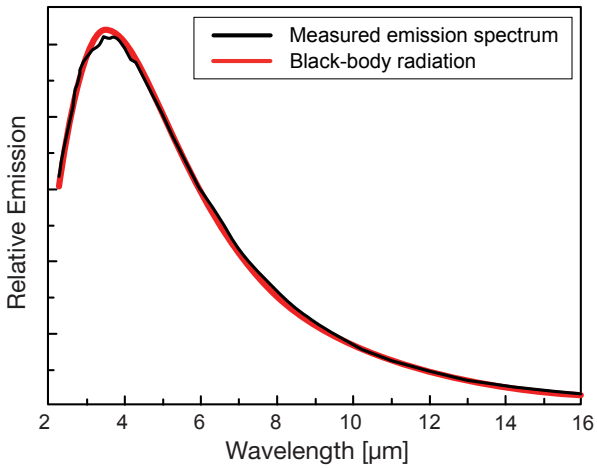
Axetris Infrared Sources for Gas Detection and Monitoring

Besides use in spectroscopic applications, Axetris IR sources are ideally suited for compact IR gas detection modules using measurement techniques such as non-dispersive infrared spectroscopy (NDIR), photoacoustic infrared spectroscopy (PAS) and attenuated-total-reflectance FTIR spectroscopy (ATR).

Key Benefits

- True black body radiation (2 to 14 µm)
- High electrical input to optical output efficiency
- Low power consumption
- High emissivity
- Fast electrical modulation
- Long lifetime and Stability

Emission Spectrum vs. Wavelength



Axetris infrared sources' emission profiles closely resemble that of a black body, and typical emissivity values of 0.85 are achieved by the unique design

Credits
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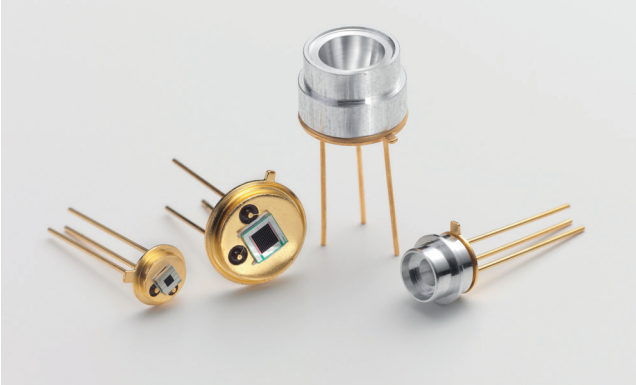
About Axetris Infrared Sources

Axetris Infrared sources are micro-machined, electrically modulated thermal infrared emitters. The unique design is based on a resistive heating element integrated onto a thin dielectric membrane, which is suspended on a micro-machined silicon structure.

Infrared sources from Axetris are used in a number of gas detection applications in medical, industrial, environmental and automotive industries.



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