

MIMA: Mars Infrared Mapper - The Fourier spectrometer for the ESA Pasteur/ExoMars rover mission

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The MIMA team is developing a FT-IR miniaturized spectrometer, to be mounted on the mast of the ExoMars rover. Such instrument shall make “remote” measurements (typically a few tens of meters away), searching for evidence of water and of water-related processes, e.g. carbonates, sulfates, clay minerals, and if possible organics. A survey instrument of this type will be extremely important for any rover mission on Mars, especially for the Pasteur payload on the ExoMars mission, whose scientific objective is to “search for life and/or hazards to humans”. Survey instruments on rover mast could provide necessary guidance, if they can identify water, evidence of long standing-water (clay minerals, carbonates, sulfates), so that detailed studies and drilling can be conducted at the right location. The MIMA design is based on the peculiar pendulum optical design already successfully used on ESA PFS for Mars Express and Venus Express missions. The wide spectral range, 2-25 micron, is not covered by means of a double channel, as in PFS, but using an innovative architecture: two different detectors on the same focal plane sharing the same optical path, in order to strongly reduce mass and size. In this work MIMA technical and scientific issues will be discussed.

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