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MIMA, a miniaturized infrared Fourier spectrometer for Pasteur/ExoMars

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The Mars Infrared MApper (MIMA) is a FT-IR miniaturised spectrometer which is being developed for ESA ExoMars Pasteur mission. The Martian Infrared MApper Fourier Spectrometer is designed to provide remote measurements of mineralogy and atmosphere of the scene surrounding a Martian rover and guide it to key targets for detailed in situ measurements by other rover experiments. Among the main scientific objectives of the MIMA instrument are to assist the rover in rock/soils selection for further in-situ investigation and to identify rocks and soils on the Martian surface which provide evidence of past/present biological activity. The instrument is also designed to measure the water vapour abundance and vertical distribution and its diurnal and seasonal variation, dust opacity, optical properties, composition, diurnal and seasonal variation. The instrument is a double pendulum interferometer providing spectra in the 2 – 25 μm wavelength domain with a resolving power of 1000 at 2 μm and 80 at 25 μm. The radiometric performances are SNR $>$ 40 in the near infrared and a NEDe = 0.002 in the thermal region. The instrument design is very compact, with a total mass of 1kg and an average power consumption of 5 W.