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Analysis of the Martian atmospheric dust and water vapour by the MEDUSA experiment

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MEDUSA (Martian Environmental Dust Analyser) is an experiment designed to provide a complete set of measurements on dust and water vapour dispersed in the Martian atmosphere under different environmental conditions (e.g., constant haze, dust storms). The instrument is a multisensor and multistage system equipped with optical and impact sensors for single grains and cumulative (dust or water vapour) deposition sensors, capable to provide size and mass distribution, number density, velocity and scattering properties of grains and water vapour concentration in the atmosphere. The in situ study of dust properties and water vapour content and evolution in Martian atmosphere has several implications to describe present and past climatic conditions, also in function of life form development, and to measure - for the first time - properties of dust and water vapour close to the planet surface. This investigation is relevant not only for the scientific value of the expected results, but also essential in preparation to future manned exploration missions of the planet, especially in relation to environmental hazard conditions.