



The advanced Miniaturized Mössbauer Spectrometer MIMOS IIA

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The two Miniaturised Mössbauer Spectrometers MIMOS II on board the two Mars Exploration Rovers “Spirit” and “Opportunity” have now been collecting important scientific data for more than four years. The MER mission has proven that Mössbauer spectroscopy is an important tool for the in situ exploration of extraterrestrial bodies, in particular the study of Fe-bearing material. The total number of targets analyzed to date exceeds 600, the total integration time exceeds 260 days for each rover. The experience gained during the MER mission makes MIMOS II an obvious choice for future missions to Mars and other targets. Currently, MIMOS II is part of the scientific payload of the approved missions Phobos-Grunt (Russian Space Agency), scheduled for 2009, and the ExoMars mission (European Space Agency), scheduled for launch in 2013, respectively. The design of the advanced and improved version of the MIMOS II instrument includes additional mass reduction. The dimensions of the electronic-board will be minimized by using state of the art digital electronics. A new ring detector system (Si-Drift detectors, SDD) will replace the four Si-PIN detectors of the current version, greatly improving the energy resolution. This will increase the signal to noise ratio and therefore either integration times can be reduced significantly or data quality can be improved in comparison to the MER instruments. In addition to the Mössbauer data, Si drift detectors allow the simultaneous acquisition of the X-ray fluorescence

spectrum, thus providing data on the sample's elemental composition.