Investigation and classification of possible Martian landing sites for the upcoming European exploration programme

P. Martin

European Space Agency, European Space Astronomy Centre (ESAC), Villafranca del Castillo (Madrid), Spain (patrick.martin@sciops.esa.int / Fax: +34 91 813 11 72)

After acknowledging the recent achievements obtained since 2003 in space science and technology, the future European Space Policy will aim at expanding the role and activities of Europe's space actors with the purpose of increasing knowledge and presence in the Solar System as well as the relevant societal benefits. With our Moon and in particular Mars as likely primary targets of such exploration goals, and after a number of very successful orbital missions performing detailed remote sensing and mapping of these planetary bodies, probe landings on the surface of the Moon and Mars represent the next stepping stone of the exploration of our close planetary environment. Along with developing the necessary hardware capabilities for Europe to reach such ambitious goals, it therefore becomes increasingly important to pinpoint with precision a number of landing sites well suited for the safety and scientific success of future robotic missions. Focusing on Mars, and although a number of candidate landing sites and associated catalogs with available scientific justification already exist, the results obtained by the orbiters Mars Express and Mars Reconnaissance Orbiter are fundamentally transforming our knowledge of the planet's surface, which in turns highlights the need to review, update and revise the candidate sites for future landing missions on Mars. A detailed investigation of possible future Martian landing sites for European missions is being prepared, based on the wealth of scientific data and high-resolution mapping products available. To support the identification of suitable sites, various mapping products (geological, hyperspectral and compositional) are consolidated, and areas of Mars identified in the recent scientific literature as primary targets for landing are taken into account. Seasonal and climatic effects potentially influencing landing shall also be considered, as well as lessons learnt from past landing experi-

ences. Finally, no-landing zones are identified based on a number of available criteria. The resulting suitable landing sites will be made available to the science-driven and success-oriented selection process for future Mars missions such as Exomars.