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# RITD - Adapting Mars Entry, Descent and Landing System for Earth

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We have developed an atmospheric re-entry and descent system concept based on inflatable hypersonic decelerator techniques that were originally developed for Mars. The ultimate goal of this EU-funded RITD-project (Re-entry: Inflatable Technology Development) was to assess the benefits of this technology when deploying small payloads from low Earth orbits to the surface of the Earth with modest costs. The principal goal was to assess and develop a preliminary EDLS design for the entire relevant range of aerodynamic regimes expected to be encountered in Earth's atmosphere during entry, descent and landing. Low Earth Orbit (LEO) and even Lunar applications envisaged include the use of the EDLS approach in returning payloads of 4-8 kg down to the surface.

Our development and assessments show clearly that this kind of inflatable technology originally developed for the Martian atmosphere, is feasible for use by Earth entry and descent applications. The preliminary results are highly promising indicating that the current Mars probe design could be used as it is for the Earth. According tp our analyses, the higher atmospheric pressure at an altitude of 12 km and less requires an additional pressurizing device for the in atable system increasing the entry mass by approximately 2 kg. These analyses involved the calculation of 120 different atmospheric entry and descent trajectories.

The analysis of the existing technologies and current trends have indicated that the kind of inflatable technology pursued by RITD has high potential to enhance the European space technology expertise. This kind of technology is clearly feasible for utilization by Earth entry and descent applications.