

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
Space Environmental Effects and Spacecraft Protection (6)

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KEYNOTE: DISCOVERER - MAKING COMMERCIAL SATELLITE OPERATIONS IN VERY LOW  
EARTH ORBITS A REALITY**Abstract**

DISCOVERER is a 5.7M Euro Horizon 2020 funded project developing technologies to enable commercially-viable sustained-operation of satellites in very low Earth orbits. Why operate closer to the Earth? For communications applications latency is significantly reduced and link budgets improved, and for remote sensing improved link budgets allow higher resolution or smaller instruments, all providing cost benefits. In addition, all applications benefit from increased launch mass to lower altitudes, whilst end-of-life removal is ensured due to the increased atmospheric drag. However, this drag must also be minimised and compensated for. One of the key technologies being developed by DISCOVERER are materials which encourage specular reflection of the residual atmosphere at these altitudes. Combined with appropriate geometric designs these can significantly reduce drag, provide usable lift for aerodynamic attitude and orbit control, and improve the collection efficiency of aerodynamic intakes for atmosphere breathing electric propulsion systems, also being developed as part of DISCOVERER. The paper will provide highlights from the developments to date, and the potential for a new class of aerodynamic commercial satellites operating at altitudes below the International Space Station.