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CHALLENGES FOR SMART SPACE: LTA (LIGHTER THAN AIR) AEROSTATS FOR GLOBE HEALTH MONITORING AND TELECOMMUNICATION

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There is clear need for development of the so-called Smart Space (complementary to satellite earth observation systems). It is motivated by the following factors and requirements:

- drastic cost reduction of earth observation and telecommunication services,
- stratospheric / tropospheric observation systems provide better image quality,
- stratospheric engineering for eco-cosmos (reduction of the cosmic trash problem).

Promising applications for monitoring aerostats might include:

- monitoring of forest heritage in Europe,
- monitoring of climate changes,
- agriculture monitoring.

This contribution will focus on and discuss a number of technological challenges that have to be solved for a successful development of Smart Space, including:

- option of economic hydrogen for LTA aerostats (vs. safe helium practice),
- photovoltaic energy supply for long-term stratospheric missions,
- innovative approach to short-term missions:
 - initial elevation (by warmed air balloon, aircraft, rocket, etc.),
 - controlled V-mobility and H-mobility,
- tethered LTA aerostats and their applications,
- Top-Drop – safe evacuation techniques for stratospheric / tropospheric wastes,
- SKYLAB (warmed air balloon) and testing technique for scaled aerostat models,
- various techniques for mitigation of impact born vibrations in ultra-light LTA structures.