6th European Conference on Space Debris

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6th European Conference on Space Debris: 
- held at ESA/ESOC, Darmstadt/Germany, 22-25 April 2013 
- organized by the ESA Space Debris Office 
- co-sponsored by ASI, CNES, DLR, UKSA, COSPAR, and IAA

Participation statistics: 
- 355 participants from 26 countries (record participation) 
- 300 abstracts received 
- 115 oral presentations in 13 technical sessions 
- proceeding to be distributed as „ESA-SP 723“ before end Sep. 2013

Concluding press conference: 
- panel members: C. Bonnal (CNES & IAA), H. Lewis (UKSA), C. Portelli (ASI), T. Schildknecht (COSPAR), M. Metz (DLR), H. Klinkrad (ESA & IAA) 
- very good media coverage throughout the Conference
highlights & core findings [1]:

- measurements & surveillance: progress on radar observation technologies was reported, particularly from Japan and China; a strong interest was noted for optical systems, in the context of tracking and surveillance applications, also in low orbits, with active illumination of targets by laser beams.
- modeling: consolidated information was provided by studies of IADC, national entities, and academia on the long-term evolution of the orbital debris environment and the suspected start of a runaway situation (known as the “Kessler Syndrome”) at 700km to 1000km altitude, leading to collisional cascading within a few decades; the reported analyses suggest that the only effective remediation action would be active debris removal at rates of 5 to 10 large objects per year.
- mass removal: concepts were outlined that employed a whole range of different physical principles to initiate an immediate, controlled, or to a delayed re-entry; mass removal concepts comprised net or harpoon-based capture & tug servicers, attached propulsion units, drag augmentation, conductive tethers, or contact-less momentum exchange through plume interaction with chemical or ion thrusters.
highlights & core findings [2]:

- on-orbit risk reduction: debris avoidance techniques and the required accuracy and information content of underlying data were highlighted; CNES and ESA explained their use of JSpOC (US Joint Space Operations Center) conjunction messages to assess identified close conjunctions, based on derived risk levels; for the protection against sub-catalog object sizes deployable shield structures were introduced; HVI studies also indicated that impact ejecta will further deteriorate the small-particle environment, and that impact-induced plasmas may cause damage to operational spacecraft.

- re-entry risk assessment: several authors reported on decay and re-entry prediction methodologies, on methods for on-ground casualty estimations, and on the determination of casualty cross-section and high-resolution population density data to support such risk assessments; the concept and application of a re-entry break-up recorder was outlined to improve our understanding of physical processes during the re-entry and break-up phase

- policies & standardization: economic aspects of controlling the space debris environment were addressed; also legal and policy aspects of SSA systems and of debris remediation were highlighted