



2nd Debris Mitigation Competition

During the 5th UNISEC-Global Meeting

December 4, 2017 at Sapienza University of Rome, Italy

Call for Papers

Following the successful results of the first Deorbit Device Competition (DDC), which was held at the fourth UNISEC-Global Meeting in Bulgaria last October, we are pleased to announce that the second competition, renamed “Debris Mitigation Competition (DMC) will be held in Rome in December 2017.

We had 22 papers from 15 countries and chose 10 finalists for the 1st DDC. At the venue, there were interesting presentations from the finalists and useful exchanges between them and the reviewers. For the 2nd DMC, a target satellite will be changed from CubeSat to Micro Satellite with a weight of up to 50 kg.

UNISEC-Global is a consortium of the local chapters (UNISEC-xx) for facilitating student’s practical space projects at university level, such as building and launching satellites and rockets. UNISEC-Global would like to play a useful role in improving awareness of long-term sustainability of space activities. In this respect, we will continue to discuss debris matters for finding better solutions.

The 2nd DMC will continue to identify possible innovate approaches to mitigate debris matters. All interested people, such as space engineers, researchers, students, are welcome to join and to present their ideas for discussion.

Objectives

To facilitate the sharing of innovative solutions for debris mitigation and developing effective post-mission disposal (PMD) and/or active debris removal (ADR) device that can be demonstrated and validated with a micro satellite.

Important Dates

January 27, 2017 : Call for papers

July 25, 2017 : Abstracts submission due (postponed from June 15)

August 30, 2017 : Notification for acceptance

October 20, 2017: Full Papers submission due

December 5, 2017: Final presentation in Rome, Italy

Requirements

Propose a post-mission disposal (PMD) or active debris removal (ADR) device that satisfies the following requirements:

1. The device must be designed for the removal of a potentially non-cooperative lean satellite of 50 kg mass and maximum dimension of 1 meter. Total mass of a satellite and device can exceed 50 kg.
2. The device will enable the satellite to re-entry within 11 years (i.e. one solar cycle) after activating. You can use any systems such as thruster, tether, membrane or electric propulsion.
3. The device will be activated at 00:00:00 UTC, January 1, 2020 with the following orbit element:

Semi-major axis	7128 km
Orbital inclination	98.4 degree
Eccentricity	0.001
R.A.A.N	30 degree
Argument of Perigee	210 degree
Mean Anomaly	190 degree

Evaluation Criteria

The proposed deorbit device is evaluated according to the following criteria:

1. Originality (20)
2. Cost (20)
3. Technical feasibility (20)
4. Effectiveness (10)
5. Reliability (10)
6. Debris risk (10)
7. Impact on/for satellite (10)



1. Originality

Has the idea not yet been realized or proposed? Is there enough originality in the idea?

2. Cost

Is it affordable for lean space missions?

3. Technical feasibility - Mechanical and electrical design

Can the idea be realized with current or emerging technology?

4. Effectiveness

How effective and how fast can the satellite re-enter?

5. Reliability

Is the idea designed to fail with a low probability?

6. Debris risk

Does the idea generate risks in producing additional debris? Will it function even if the satellite is non-cooperative?

7. Impact on/for satellite

What is the mass, volume, power and operational requirement on/for the satellite to be removed?

Abstract template

Please download the abstract template at the website. <<http://unisec-global.org/dmc/>>

Contact

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