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Deorbiting of Space Debris by Laser Ablation

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Recent years deorbiting by the laser ablation attracts increasing attentions as almost unique effective method to remediate cm-sized space debris. According to Ebisuzaki et al. 2014, the deorbiting operation is divided into three steps. First, a super-wide field telescope detects the reflection signal of the solar light by a space debris and roughly determine its position and moving direction. Second, laser beams are ejected to the directions of the debris to determine the position and velocity precisely as well as its distance. Finally, a high intensity laser beam is focused onto the debris surface to induce laser ablation on the surface. The reaction force of the ablation leads the debris to the deorbiting to the Earth's atmosphere. In this talk, we will propose the step-by-step approach for the technical demonstration of the mission and present the concept of a possible space mission dedicated to deorbiting cm-sized space debris by laser ablation technology.

[1] Ebisuzaki et al., Demonstration designs for the remediation of space debris from the International Space Station, *Acta Astronautica*, 112 (2015), 102-113.

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