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SPACE DEBRIS

Abstract

A half million pieces of space debris is cluttering Earth's orbit, according to NASA, this means there is a growing problem of cluttering in space. Several entities have proposed ways to get rid of space junk. The European Space Agency is considering several kinds of "capture mechanisms" to pick up the debris using nets, harpoons, robotic arms and tentacles. The De Orbit mission first proposed publicly in early 2014 would seek out satellite debris in a polar orbit at an altitude between 800 and 1,000 kilometres. The company, Swiss Space Systems plans to launch the Clean Space shuttle. The Japanese Aerospace Exploration Agency proposes slowing the satellite speed would make it gradually fall closer to Earth and burns up. Space Junk Solar Sail a British proposal called Cube Sail would use the drag of a solar sail to push orbiting space debris down to lower orbits. Space Debris Elimination- Huff and Puff method would push satellites into a lower orbit by using air bursts within the atmosphere. The "old-fashioned" method allows only five satellites out of orbit each year for the next 100 years, while adhering to an international understanding called the 25-year rule, The 25-year rule stipulates that nations should not launch objects whose lifetime in space will exceed 25 years after the completion of their missions. The old satellite's antenna could be recycled and incorporated into the tiny satellite, effectively creating a new communications system. The earth orbits have the largest density of debris and the highest relative speeds, while the atmospheric drag is small enough that it may take centuries to have the debris re-enter the atmosphere. An another approach would use the principle of deflecting an electrically charged, moving object in a magnetic field using a space-based electron gun to generate an electron beam directed at the orbital debris. The beam imparts an electric charge to the debris; Earth's magnetic field would exert a force on the electric charge of debris crossing the magnetic field at high speed, modifying its orbit. Over time, the orbit would become highly elliptical and would intersect the upper atmosphere, where the debris would vaporize or fall to Earth. Preliminary calculations have explained benefits such as lower cost, feasibility, low risk atmospheric drag, lunar perturbations and solar radiation pressure. We also suggest the use of self destructive automated satellites and the usage of degradable satellite materials to reduce space debris.