Paper ID: 79147
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IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Small Launchers: Concepts and Operations (7)

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THE FUTURE OF SATELLITE LAUNCHES: REVOLUTIONIZING THE INDUSTRY WITH ELECTROMAGNETIC TECHNOLOGY

Abstract

With the demand for satellite technology on the rise, the need for cost-effective solutions has become increasingly critical. Advances in smaller, more advanced satellites have opened up opportunities for alternative launch methods beyond traditional rocket launchers employed by companies such as Space X and Roscosmos. Companies and universities worldwide are investing in innovative approaches to reduce the cost of launching small satellites into space. For example, SpinLaunch is researching the possibility of using a centrifuge to generate the necessary speed, while other firms are exploring the potential of air balloons or space elevators. Moreover, as more companies and institutions enter the satellite launch market, competition will drive down launch costs further. This will create new opportunities for businesses and researchers, enabling more innovative uses of satellite technology across industries, from telecommunications to agriculture. Our team has chosen electromagnetic technology to develop a satellite launcher, which we believe could revolutionize the industry. Its simplicity and scalability make it a highly promising option, as there are no mechanical moving parts involved, ensuring reliability and efficiency. The principle behind this technology is based on the Lorentz force, which is the force exerted on a charged particle moving in a magnetic field. Our preliminary analysis has shown that this method has the potential to provide the required propulsion to launch satellites into low Earth orbit, utilizing electromagnetic forces instead of complex mechanical components. In addition to cost savings, electromagnetic launch technology also has a lower environmental impact compared to traditional rocket-based systems. Rocket launches produce significant amounts of pollution, including carbon dioxide and other greenhouse gases, which contribute to climate change. Electromagnetic launch systems produce much less pollution and have a smaller carbon footprint, making them a more sustainable option for space exploration. Overall, the use of electromagnetic technology to develop a satellite launcher has the potential to revolutionize the way we launch satellites into orbit. We are enthusiastic about exploring the capabilities of this technology for the future of space exploration