46ESS-65: Electromagnetic thrusters for space applications

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Spacecraft propulsions can be divided into many categories. In the spacecraft propulsion's field, reaction engines are the most common. Those systems rest on the Newton's third law. The main way to classify these solutions is their means of accelerating their reaction mass and which forces and physics principles they use to produce thrust. In opposition with chemical propulsion like rocket engines, we find also electric propulsion with electromagnetic thrusters which used Lorentz force to ionise a gas, accelerate it and produce thrust. Although they provide lower thrust than rocket engines, they have turned out to be of great interest especially for space exploration because of their thrust durability. By the way, they are currently good candidates for manned mission to Mars as they can run during several months and even years.

This type of propulsion has already been developed and implemented for real missions. However, over time, different concepts of electromagnetic thrusters have emerged and with them, big expectations for the future of space exploration.