

66th International Astronautical Congress 2015

13th IAA SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FUTURE (D4)  
Space Elevator Tether and Space Mineral Resources (3)Author: Mr. Abbishek G  
India, g.abbishek@gmail.comMr. Rohan Kulkarni  
India, rk.aerofreak@gmail.comDr. Ugur Guven  
United States, drguven@live.comMr. Sharad Chopra  
University of Petroleum and Energy Studies, India, sharad.chopra@ymail.comMr. Dishant Kothia  
University of Petroleum and Energy Studies, India, dishant.kothia95@gmail.comASTEROID CAPTURING TECHNIQUE USING MAGNETIC WAVE GENERATOR AND ION  
THRUSTERS.**Abstract**

Metals have become one of the basic needs of life. Mankind is using these natural resources at such a rate that it is predicted that in about 50-60 years, all these resources in the earth will be depleted. To tackle this situation mankind is looking into outer space for getting some resources. In this respect, asteroids are seen as a rich source of metallic minerals. It has been discovered that some rare metals are also found on them which are not present in earth. The idea is to capture an M-type asteroid from the asteroid belt and shifting it to an orbit around the moon so that it can be mined for its minerals. The composition of metallic asteroids is mainly refinery grade iron, nickel and cobalt with some amounts of rare metals like gold, platinum etc. The asteroids rotate about its axis while revolving around the sun. Ion thrusters will be employed at certain inclination to provide anti torque to the asteroid so to stop the rotation of the asteroid. A spacecraft will be deployed in front of the asteroid which will generate a magnetic wave. Four thrusters will be deployed on the four sides of the asteroid and will act as a barrier for the magnetic field. The barrier will either absorb the wave or reflect the wave back. The system will act as a pyramid in which the asteroid will be enclosed. The minerals in the asteroid mostly being magnetic by nature will get magnetise by the magnetic wave and the asteroid as a whole will get attracted towards the wave generator. The spacecraft will move forward carrying the asteroid with it. As soon as the asteroid reaches near the earth, the magnetic wave will be stopped. The four thrusters would than reattach with the asteroid and push it until it gets settled in an orbit around the moon. Initial development of this method is quite expensive but in long run the method is technologically and economically feasible as some of the mined minerals may be priceless. This method can only be employed for M type asteroids. Further studies are required to capture other class asteroids using this method.