

Abstract Submitted
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Ballistics of space launch by a rail gun ALEXANDER PANIN, Utah Valley University — The idea of using a big gun to launch objects to space has been around for years – even Isaac Newton considered the concept. However the technology of accelerating a payload with a gun only recently began approaching orbital velocity (8 km/sec). NASA is currently experimenting with a rail gun which utilizes a magnetic field powered by electricity to accelerate a projectile along a set of rails, similar to train rails. Velocities up to 3 km/sec have been reported for small projectiles, and it seems that orbital velocities can soon become a reality too. We model a launch of various projectiles from Earth surface into the elevation corresponding to the low Earth orbit (about 200-250 km above Earth's surface). The goal of this modeling is to study feasibility of such launch (and accelerations induced), and the ballistics of the flight via Earth's atmosphere (the trajectory, air drag induced, pressure and temperature generated by air drag, etc) and thus the requirements for a mass, size, strength, heat shield, and general design of a payload capsule.

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