介紹

質量投射器，一般是指藉由電磁場作用力對物體進行加速的裝置[r]

原理上可以大致分為兩種:磁軌砲(Railgun)、線圈砲(Coilgun)。[w]

Mass driver generally refers to device that accelerates objects by the force of an electromagnetic field.[r]

There are two principles: Railgun and Coilgun. [w]

磁軌砲利用勞倫茲力原理，藉由通電軌道對導體投射物加速；[r]

線圈砲則利用通電線圈產生磁場，對帶磁性的投射物加速。[r]

利用電磁作用力進行彈射的裝置在現實中已有許多運用，像是磁浮列車、航空母艦上的飛機彈射裝置，[r]

近年來美、中兩國也發展出了裝置在船艦上的磁軌砲，能直接利用電能發射超高速砲彈。[w]

The magneto-gun uses the Lorenz force principle to accelerate the conductive projectile by an electricized orbit;[r]

The coil gun uses a pass wire ring to generate a magnetic field that accelerates the magnetic projectile.[r]

Devices that use electromagnetic forces for catapulting have been used in many real-world applications, such as maglev trains an aircraft ejaculation devices on aircraft carriers.[r]

In recent years, the United States and China have also developed magnetic rail guns installed on ships that can directly use electricity to fire ultra-high-speed artillery shells. [w]

利用電磁力投射作為太空船的發射裝置，NASA就曾經提出這樣的想法，但現階段有許多發展上的障礙:[lr]

不論是線圈砲或是磁軌砲，都需要極龐大的電能；[r]

此在發射的過程中，會有大量能量作為熱能散失，甚至導致設備壽命低；[r]

此外，人類能承受的G力有限，最大不能超過9G，使得加速距離最少需要將近400公里，[r]

如此長的發射軌道在建設上不太可能實施。[w]

也就是說，若要發展出真正能實際運用的太空船電磁發射裝置，[r]

必須克服以下缺點:[lr]

龐大能量來源、建設龐大的軌道、以及如何減少加速產生的G力。[w]

NASA has come up with this idea using electromagnetic force projection as a launcher for spacecraft, but there are many obstacles to development at this stage:[lr]

Whether it's a coil gun or a magnet rail gun, it requires a lot of electrical energy;[r]

During this launch, a large amount of energy is lost as heat energy, which can even lead to a low life of the equipment;[r]

In addition, humans can withstand limited G force, up to a maximum of 9G, so that the acceleration distance needs a minimum of nearly 400 kilometers,[r]

Such a long launch orbit is unlikely to be implemented.[w]

In other words, to develop a spacecraft electromagnetic launcher that can really be used,[r]

The following shortcomings must be overcome:[lr]

Huge sources of energy, building huge orbits, and how to reduce the G-force generated by acceleration. [w]