

SYNCHROTRON DRIVE

**A FASTER AND EFIFCIENT PROPULSION
METHOD**

SYNCHROTRON DRIVE

PROPULSION TECHNIQUE

Ion drives and being used for the propulsion of various space vehicles.

I have tried to provide a new propulsion technique that is potentially more useful than ion thrusters, the reason being that this technique can provide much higher efficiencies and thrust than ion thrusters.

Introduction

These thrusters consist of synchrotron systems in addition to the ion thruster systems.

Working

The ion drive system produces and accelerates the ions to an initial velocity in order to produce thrust, this thrust is however extremely small.

In my proposed synchrotron drives the atoms are first ionized i.e. the electrons are shredded off from the ions and are sent to the neutralizer. Meanwhile the ions are fed into a synchrotron system to increase their velocity to relativistic speeds.

At relativistic speeds the mass of the ions is increased owing to the theory of relativity,

$$M = M_0 / [\text{sqrt}(1 - (v^2/c^2))]$$

Clearly, as the velocity of the ions is increased by the synchrotron their mass begins to increase as they approach the speed of light



This increase in the mass leads to an increase in their momentum and hence an increase in the thrust.

Further we can see that the velocity or the thrust of the drives is the function of the velocity of the ions, as the mass of the ions is a function of the velocity.

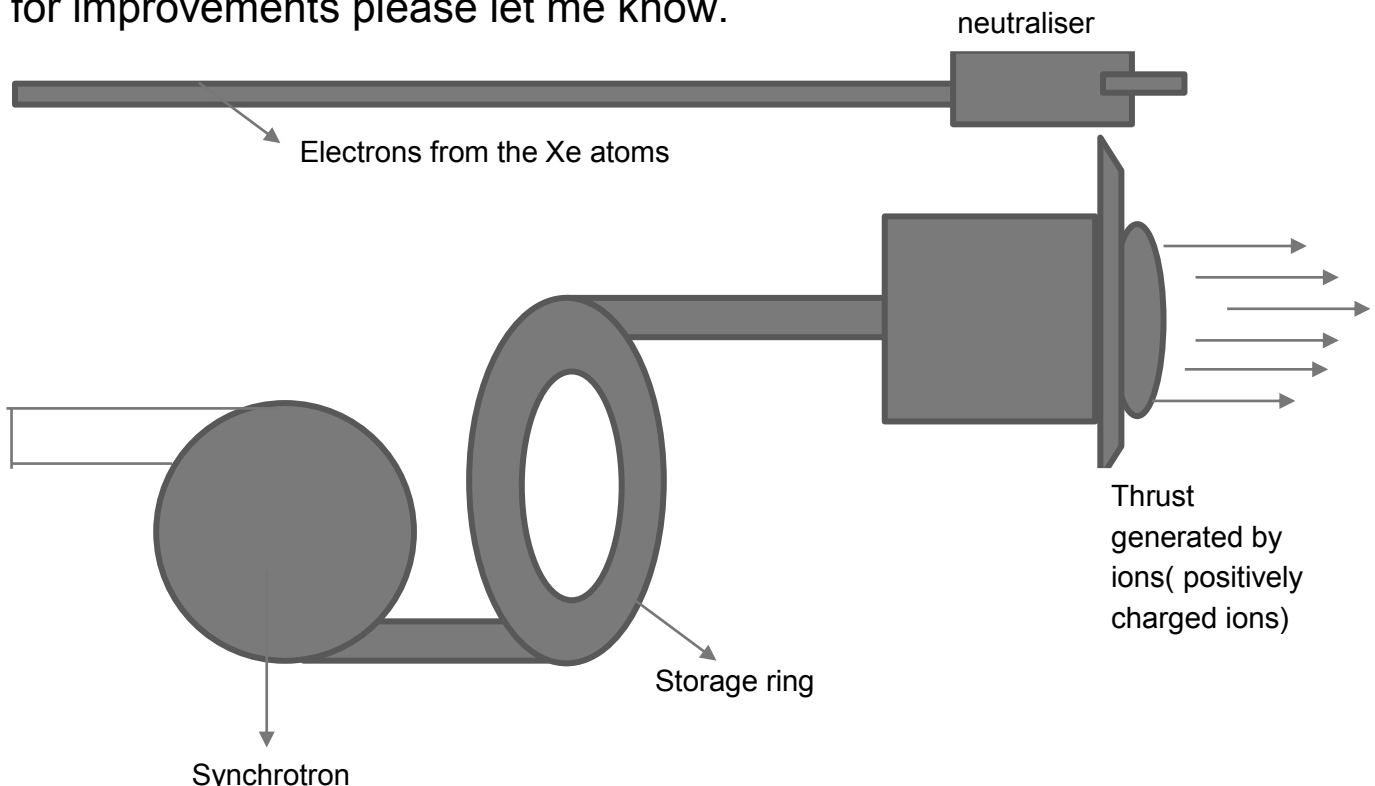
In conclusion I would like to say that this technique can produce more thrust and hence enable high speed traversing of the space vehicles.

I am currently working on the precise design of the synchrotron drive, But I would appreciate it if the readers can comment or give me any suggestions.

This synchrotron used in the system can be powered by nuclear reactors.

A basic flow diagram of the working of this system is shown below.

Note that this is just a basic diagram and if you have any suggestions for improvements please let me know.



WORKING

Initially, the Xe atoms are ionized to produce electrons and Xe cations. These Xe cations are accelerated to relativistic speeds in a synchrotron and are stored in a storage ring. These ions are then sent to the thrusters and thrust is generated due to Newton's third law. To neutralize these positively charged ions, the electrons that were previously ripped off from the Xe atoms are introduced into the ion beam with the help of a neutralizer.

This is the working of the device.