

1 Introduction

With the increasing flight distance and time on orbital mission of deep space exploration mission, the traditional spacecraft which relies on the reaction propulsion will need to carry more fuel and energy, which means that the payload of the spacecraft will increase, thus limiting its maximum speed.

In recent years, solar sail as a new type of spacecraft has attracted much attention. It can be powered by solar pressure without having to carry a large amount of fuel. Therefore, it has been widely used in interplanetary navigation and deep space exploration.

The advantages of solar sail spacecraft is that it does not need to carry a large amount of propellant. Although the solar radiation is very small, but the continuous acceleration from the large, ultrathin mirrors can harness the faint pressure of the sun's reflected light to move through the vacuum of space and reach a considerable speed which is about 5-10 times faster than traditional spacecraft, suitable for deep space exploration.

In this paper, we studied the AAAAA of solar sail, gave the differential equation of bbbbb, and designed the ccccc. Finally, we obtained the optimal flight plan of solar sail with the realisation of the shortest transit-time and the maximum payload.