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FROM THE EARTH TO THE MOON BY GONDOLA

Abstract

To set up a gondola transportation system between two locations, you first need two stations, one for departure and one for arrival, and a cable to connect them.

Applied to a two-way transportation system between the Earth and the Moon, those stations would be the South Pole of the Earth on the one hand and a lunar place on the near side of the Moon on the other hand.

A bundle of cables would connect these two terminals and enable the transportation of passengers and cargo between them, with possible intermediate platforms in some noticeable locations such as the Lagrangian L1 point of the Earth-Moon system, the Earth geostationary orbit area or some gravitational analogs of Mars or the Moon, closer to the Earth.

As a consequence of the orbital characteristics of the Moon with respect to the Earth, some major concerns have to be solved: the 28-day rotation period of the Moon around the Earth, the variation of its elevation angle between -28 and +28 with respect to the Equator and the variation of the Earth-Moon distance by about 50.000 km in a two week time frame.

How can such a transportation system be set up?

It has to start from the Moon through the installation of a first section stretching from the lunar station to the Earth-Moon L1 area located about 58.000 km above the lunar surface. From then on, a second stage would consist in unwinding a section of more than 320.000 km of cable that would be attracted by the Earth gravity. Once its extremity is getting close to the Earth (10.000 km), it is grasped by a space plane which will drive it towards the Earth South Pole base. As soon as the cable enters the stratospheric layer, a chain of prepositioned stratospheric balloons linked to the South Pole base will be connected to the extremity of the space cable.

The purpose of the proposed paper is to show that this innovative space transportation system does not violate any physical law and could be a major rationale for setting up and operating a Moon Village.

A preliminary operational scenario will be described, which will be compatible with the constraints arising from the natural motion of the Moon with respect to the Earth.