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NASA SHOULD INSTALL AN L-BAND RECEIVER ABOARD THE LUNAR GATEWAY (LOP/G) FOR SETI SEARCHES

Abstract

The orbit of the Lunar Gateway (also called LOP/G, i.e. Lunar Orbiting Platform / Gateway) was announced in July 2019 jointly by NASA and ESA. It is a quasi-rectilinear orbit, i.e. an elliptical orbit with eccentricity higher than 0.9 and with perilune above the Lunar South Pole. The goal of this orbit is to let astronauts transfer easily from LOP/G to the lunar surface just where the ice is, i.e. within the South Pole region. Moreover, this LOP/G orbit minimizes the eclipses, i.e. the time when radio communications between the Earth and LOP/G will not be possible since the spherical Moon body will block them.

As such, the LOP/G orbit seems to be rather unsuitable to probe the radio silence still existing above the Moon Farside, that is the goal of radio-astronomers intending to conduct SETI searches either from space above the Farside or from the Farside surface (and from crater Daedalus, in particular).

Nevertheless, the SETI international community should ask NASA to install an L-band receiver aboard the Lunar Gateway (LOP/G) for SETI searches, thus catching an opportunity for SETI that will hardly repeat itself within this decade.

This paper is devoted to conduct a preliminary study of how an L-band receiver installed aboard LOP/G would transform LOP/G into the first SETI space mission ever above the Farside.