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Bistatic radiolocation of the Moon in the project “Luna-Resurs”

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Bistatic radiolocation of the Moon is one of the few methods for remote study of the structure and mineralogical composition of the upper cover of the Moon. In the Russian project "Luna-Resurs" it is planned to carry out bistatic measurements involving the radar complex RLK-L placed on the Luna-26 orbiter and the Irkutsk incoherent scatter radar administered by the Institute of Solar-Terrestrial Physics of Siberian Branch of the Russian Academy of Sciences. Experiments will be conducted according to both “up link” and “down link” scheme. From the electrodynamic principle of reciprocity, it follows that the areas of reflection on the surface of the moon when probing using the “up link” and “down link” schemes coincide. The center of this region is derived from the condition that the angles between the normal to the surface of the Moon and the direction to the Earth and between the same normal and the direction to the spacecraft are equal. The linear dimensions of the region most essential for reflecting radio signals are associated with the Fresnel zone. The report is devoted to the developed method of determining the center of the reflection area and the coordinates of its border in the MOON ME (Mean Earth) selenographic system using ballistic data from the Luna-26 apparatus for visualizing the experiment, predicting its results and further solving the inverse problem of the subsurface sensing of the Moon’s soil.