

Calculation of Antenna Gain via 3D Radiation Pattern and Estimation of Their Mutual Influence

V. I. Tolkachev, *Cand. Sci. (Military)*, tolkachev_1707@mail.ru

Joint Stock Company "Russian Space Systems", Moscow, Russian Federation

O. G. Pikalov, *Cand. Sci. (Engineering)*, pikalov-og@bk.ru

Joint Stock Company "Russian Space Systems", Moscow, Russian Federation

S. V. Pan'chev, *Cand. Sci. (Engineering)*, sergey_p76@mail.ru

Joint Stock Company "Russian Space Systems", Moscow, Russian Federation

I. G. Novikov, novige@mail.ru

*Federal State Budget Educational Institution "Moscow Technological University" (MIREA),
Moscow, Russian Federation*

Abstract. The paper considers the task to determine the gain of the optionally beamed antenna on the set direction. It is necessary to solve the task when evaluating electromagnetic compatibility of radio engineering systems involving both receiving and transmitting segments equipped with in-house antennas. The main attention is focused on treatment and analysis of the form of the antenna radiation pattern appearing as a 3D rotation figure.

The determination of the intensity of the 3D interaction of receiving and transmitting antennas by means of simulating the radiation patterns considering their mutual orientation is one of the most important task of obtaining the degree of the influence of the transmitting segment on the reception devices of the radio engineering system.

The method given in the paper presumes a simple software realization and is slated to be applied in the special software product created for the analysis of the electromagnetic situation in radio engineering systems, as well as for evaluating electromagnetic compatibility of radioelectronic facilities.

Keywords: antenna radiation pattern, antenna gain, electromagnetic compatibility