
The method of determining the coordinates of the radio source

© A.A. Greshilov

Bauman Moscow State Technical University, 105005, Russia

The article describes a method for determining coordinates of the radio source when receiving a signal from a radio radiation source (SRE) using a nonlinear (including annular) antenna system (AS), an arbitrary shape consisting of poorly directed and directional elements (vibrators), and other methods of determining direction, for example, based on the Doppler effect, radio imaging, and others. Multistage registration systems as featured on the ground, on aircraft are used. Improved the accuracy and reduced the time to determine the origin of the radio source are achieved by use, an universal formula describing the complex envelope outputs of the AS, which allows to obtain explicit expressions for calculating the amplitude and initial phase of the bearing signals. The collected values of bearings from different devices detect the signal of SRE using the methods of confluent analysis, obtained equations of the lines in the plane and in space, the intersection of which determines the coordinates of the point estimates of the radiation source. For estimates of bearings and coordinates the radiation source is obtained, covariance matrix scattering estimates is obtained from an ellipse or ellipsoid scattering unknown quantities.

Keywords: bearing, antenna systems, source of radio emission, iterative process, the inverse matrix.

Greshilov A.A. (b. 1939) graduated from the Moscow Engineering Physics Institute in 1964. Dr. Sci. (Eng.), Professor of the Higher Mathematics Department of Bauman Moscow State Technical University. Author of more 150 publications, including more than 30 monographs, 30 patents and certificates in the development of mathematical methods of accounting for uncertainty of the initial information in mathematical physics, pattern recognition, forecasting, and other technical applications. e-mail: agresh@mail.ru
