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Generation of Artificial Ionospheric Irregularities in the Midlatitude Ionosphere Modified by High-Power High-Frequency X-Mode Radio Waves

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Abstract

© 2014, Springer Science+Business Media New York. We consider the properties of the artificial ionospheric irregularities excited in the ionospheric F2 region modified by high-power high-frequency X-mode radio waves. It is shown that small-scale (decameter) irregularities are not generated in the midlatitude ionosphere. The intensity of irregularities with the scales $l_{\perp} \approx 50$ m to 3 km is severalfold weaker compared with the case where the irregularities are excited by high-power O-mode radio waves. The intensity of the larger-scale irregularities is even stronger attenuated. It is found that the generation of large-scale ($l_{\perp} \approx 5$ –10 km) artificial ionospheric irregularities is enhanced at the edge of the directivity pattern of a beam of high-power radio waves.

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