Государственное образовательное учреждение
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**«Томский государственный университет
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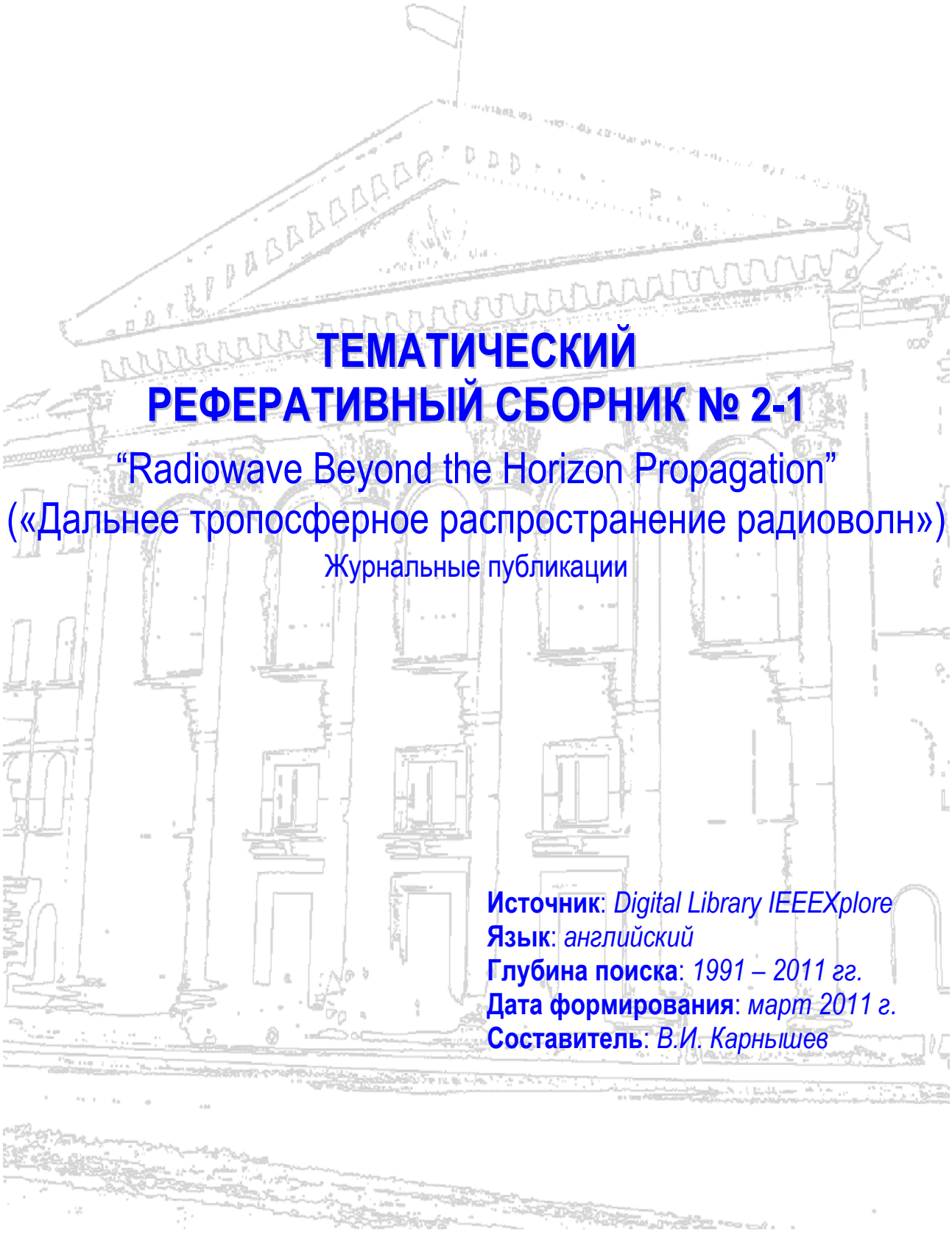

ТЕМАТИЧЕСКИЙ РЕФЕРАТИВНЫЙ СБОРНИК № 2-1

“Radiowave Beyond the Horizon Propagation”
(«Дальнее тропосферное распространение радиоволн»)

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"Propagation Over Parabolic Terrain: Asymptotics and Comparison to Data"

Analysis of radio propagation over varying, clutter-covered terrain was carried out aiming at prediction of power received by a terminal immersed in clutter, with the transmitter placed above clutter. The need for such prediction arises, for example, in planning and assessing coverage and interference in radio communications. Following a general formulation of the problem, particular solutions were found when the terrain has constant curvature. Asymptotic evaluation yielded compact expressions both for parabolic valleys and ridges. In both cases, ray-optical term dominated for short ranges, while a single mode dominated at large ranges. Strong focusing was found to occur in valleys, while ridges produced strong blockage beyond the ??horizon??. The resulting procedure for predicting pathloss over varying terrain is therefore to apply the formulae using the terrain curvature extracted from terrain files. In comparison to measured power across a valley, mean errors of less than 1 dB were found, a marked improvement over standard terrain-unaware models that produce a mean error of 30 dB. [J1]

"Concurrent Operation of Two Over-the-Horizon Radars"

By exploiting the reflective and refractive nature of high-frequency (HF) radiowave propagation through the ionosphere or the conducting sea surface, over-the-horizon radar (OTHR) systems perform wide-area surveillance at long range well beyond the limit of the horizon of conventional line-of-sight (LOS) radars. Improved characterizations of the targets can be achieved by using multiple OTHRs operating simultaneously as compared to a single OTHR operating alone. In this paper, we consider concurrent operations of two OTHR systems that occupy the same frequency band with different chirp waveforms. The objective is to respond to the advanced wide-area surveillance needs without reducing the wave repetitive frequency. For this purpose, a new cross-radar interference cancellation technique is developed and its effectiveness is verified through both analytical and simulation results [J2]

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