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Title : TRANSMISSION OF INFORMATION THROUGH AN ARTIFICIALLY IONIZED ATMOSPHERE



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Abstract : Electromagnetic communications through an artificially ionized terrestrial atmosphere are reported. If the tolerated interruption in the communications link should not exceed a fraction of a second after the ionizing event, coherent narrow band light receivers and transmitters in the wavelength region between 1 and 100 microns are recommended. These conclusions were based on the computation of the critical frequency of a hot terrestrial atmosphere. To describe the absorption of electromagnetic radiation in the wavelength region of interest, resonant and nonresonant microwave absorption theories have been extended to higher frequencies. Communications links which can tolerate substantial interruptions after the ionizing event can operate in the microwave wavelength region. The duration of the interruption is determined by the kinetics of atmospheric plasmas. The rate equations for such plasmas were derived and some of the coefficients determining the decay were computed on a quantum mechanical basis. (Author)

Descriptors : *COMMUNICATION AND RADIO SYSTEMS, *DATA TRANSMISSION SYSTEMS, ATMOSPHERICS, ELECTROMAGNETISM, IONIZATION, KINETIC THEORY, MICROWAVES, PLASMAS(PHYSICS), SIMULATION.

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