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KEY WORD: DEPOLARIZATION / EFFECTIVE PERMITTIVITY / RAIN

DHEERASAK ANANTAKUL : DEVELOPMENT OF AN EXPERIMENTAL SET FOR THE STUDY OF ELECTROMAGNETIC WAVE DEPOLARIZATION DUE TO RAIN. THESIS ADVISOR : CHATCHAI WAIYAPATANAKORN, Ph.D. 148 pp. ISBN 974-636-436-7.

Propagation of electromagnetic waves through a rainfall region is affected by both attenuation and depolarization. The depolarization phenomenon causes cross-channel interference, which affects performance of a communications system.

The study of this problem can be done by measuring the signal in any links and comparing the measured results between the no-rain and raining periods. This is not convenient for the preliminary study in order to understand rain-induced depolarization mechanisms. The author has developed an experimental set which can model wave propagation through a rainfall region for the preliminary study. This experimental set can be adjusted to change some factors affecting propagation characteristics. These factors come from the theoretical analysis.

The measured results show the differential attenuation and differential phase shift which are responsible for the basic depolarization mechanisms. Although the results are different from the theoretical results, this is due to the differences in characteristics of the real rain and the rain which comes from the experimental set. Therefore it can be concluded that the experimental set can be used for the preliminary study of electromagnetic wave depolarization due to rain.

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