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Source: [Hirokazu Sawada, Yozo Shoji, Chang-Soon Choi, Katsuyoshi Sato, Ryuhei Funada, Hiroshi Harada, Shuzo Kato, Masahiro Umehira]
Company [National Institute of Information and Communications Technology]
Address [3-4, Hikarino-Oka, Yokosuka, Kanagawa, 239-0847, Japan]
Voice:[+81.46.847.5096], FAX: [+81.46.847.5079], E-Mail:[sawahiro@nict.go.jp]
Re: []

Abstract: [This contribution describes improvement for the amplitude statistics in S-V model.]

Purpose: [Contribution to mmW TG3c meeting.]

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Improvement for the amplitude statistics in S-V model

Hirokazu Sawada, Yozo Shoji, Chang-Soon Choi,
Katsuyoshi Sato, Ryuhei Funada, Hiroshi Harada,
Shuzo Kato, and Masahiro Umehira

National Institute of Information and
Communication Technology (NICT), Japan

Agenda

- Background
- Problems of generated rays in Matlab code
- Improvement for amplitude statistics in S-V model

Background

- Too strong rays (which physically can not happen) are generated in Matlab code, then these rays are a few but not negligible

- Applying some limitation for the ray's amplitude can increase the accuracy of channel model and enable us to perform reasonable simulations

Problems of generated rays in Matlab code

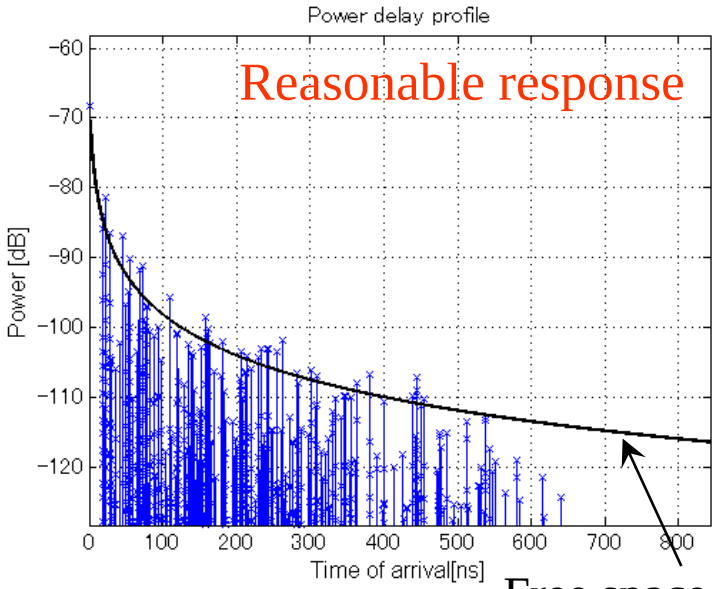

Fig.1 Snapshot of generated delay profile using LOS office parameters

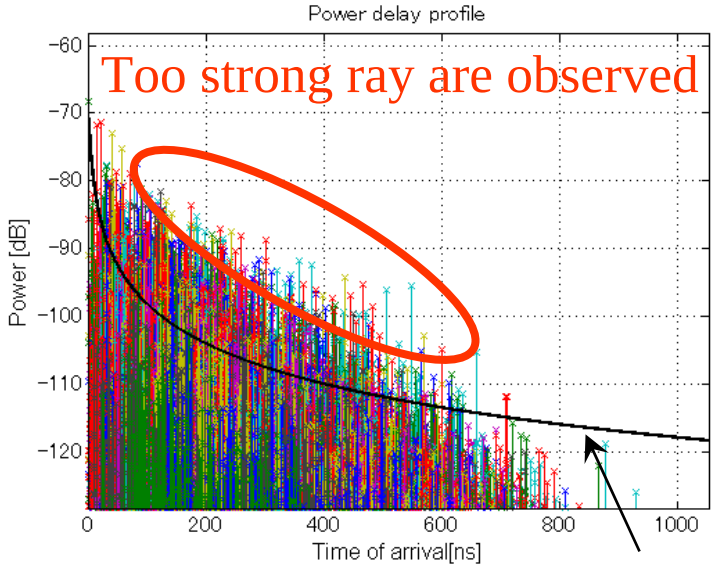

Fig.2 Realization of 200 generated delay profile using LOS office parameters

- Current version Matlab code generates too strong rays due to Log-normal distribution assumption for its amplitude model
- Any limitation should be processed for the ray amplitude by according to measurement results

Measured PDPs for LOS residential and office

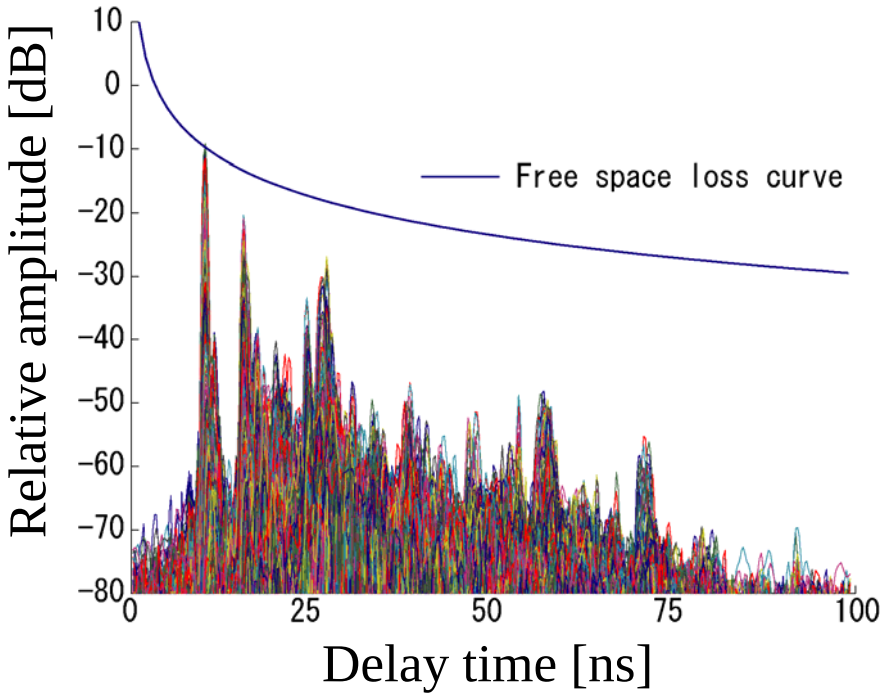

Fig.3 LOS Residential environment

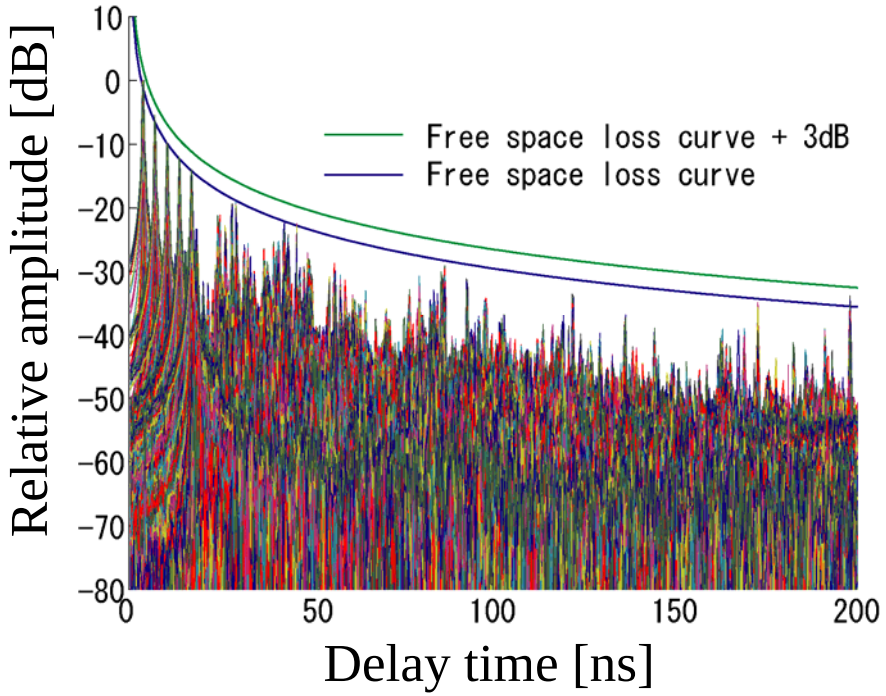

Fig.4 LOS office environment

- Ray's amplitude in LOS residential environment less than free space loss
- Ray's amplitude in LOS office environment larger than free space loss

Measured PDPs for LOS desktop

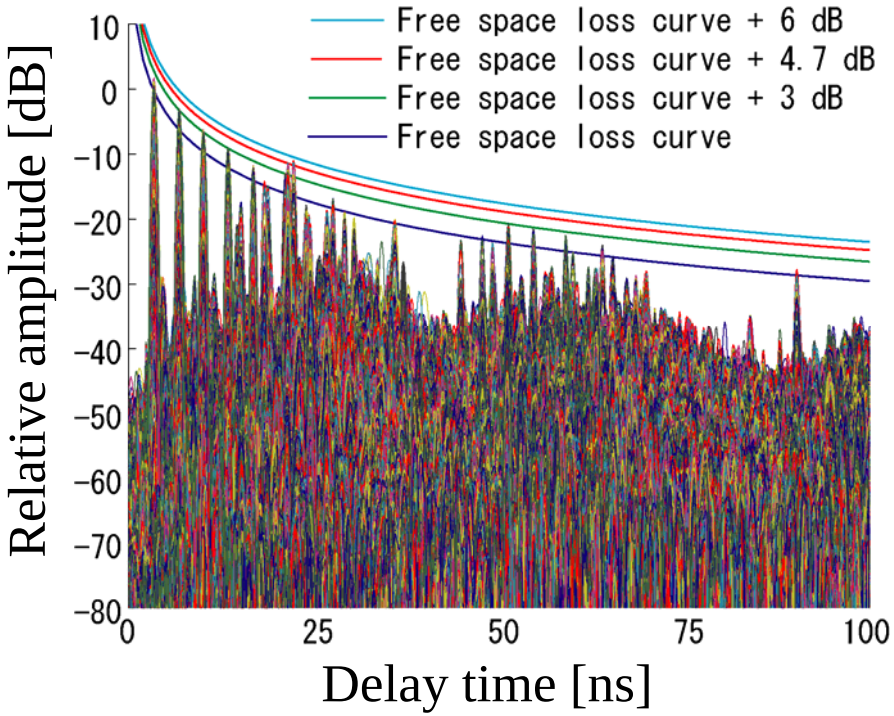

Fig.5 LOS Desktop environment

- Ray's amplitude in LOS desktop environment are larger than free space loss many times, because merged two-path waves are reflected in multi-path
- Maximum Ray's amplitude is less than free space loss + 6dB

Improvement for amplitude statistics

- We suggest to limit the amplitude of ray as follows

  Maximum amplitude of ray < Free space loss + 6dB

How to implement in Matlab function

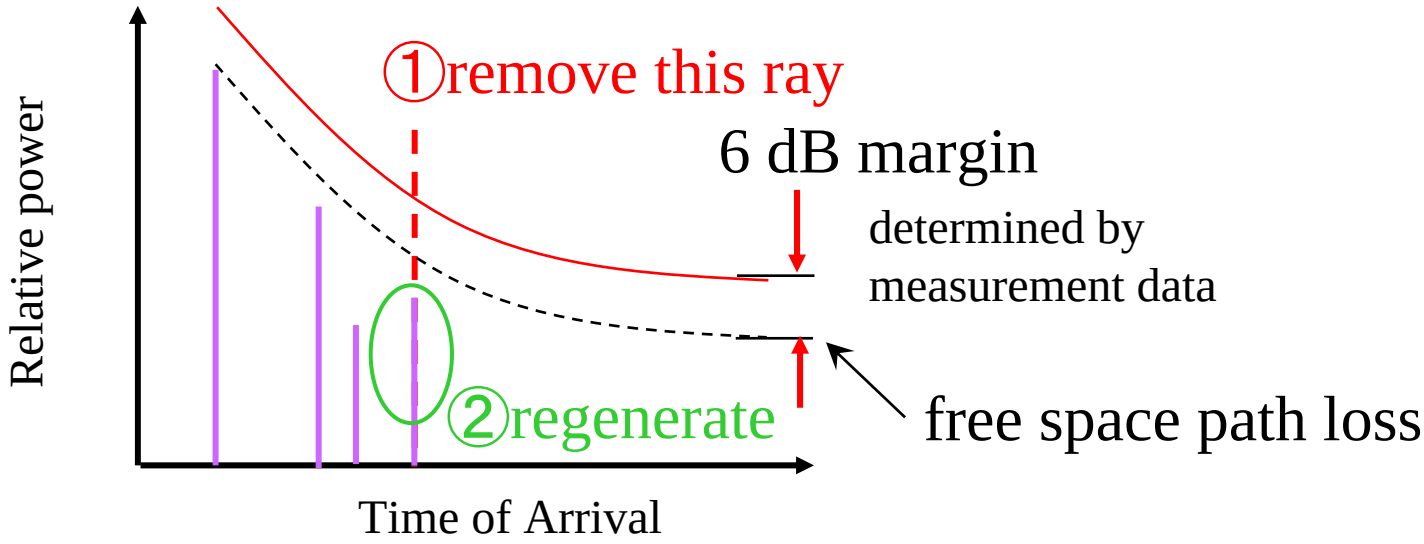

Fig.6 Criterion of amplitude limitation

- We propose that the ray should be generated again if it exceeds the limitation value

Conclusion

- We suggested the method to improve amplitude statistics of S-V model by employing physical limitation
- Criterion of limitation for the maximum amplitude of ray was shown for Matlab simulations