Outdoor Transmission Measurement at 26 GHz; Results of a 4 Years Trial in Prague

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This paper presents the results from a four-year field trial that was performed in Prague, Czech Republic on a 5.5 km long radio link path operating at 26 GHz. The purpose of the trial was to investigate the amount of attenuation due to precipitation and its yearly variation. Both attenuation of the radio link signal and the rain rate were measured and will be presented. The measured attenuation results are compared to the models given by the Rec. ITU-R P.530-15 [International Telecommunication Union (ITU) (2013), Propagation Data and Prediction Methods Required for the Design of Terrestrial Line-of-Sight Systems, Recommendation ITU-R P.530-15, International Telecommunication Union, Geneva] and the actual rain rate. The propagation measurements show large yearly variations due to variability in rain rate from one year to another. These variations represent a risk that must be taken into consideration in radio link planning. The measured results are in agreement with the long-term statistical rain attenuation model in Rec. ITU-R P.530-15 if the measured rain rate for the individual year is used. For the worst year the number of fades, the fade duration, the fade speed, the worst month statistics and the polarization correlation are presented. The measurements presented will add to the current knowledge of fading due to precipitation, and some of the results such as the fade duration distributions are new knowledge. The results from the first year of these measurements have been presented earlier [Thorvaldsen, P., and V. Kvicera (2002), 26 GHz Crosspolar Trial in Prague, Teleinformatika 2002].
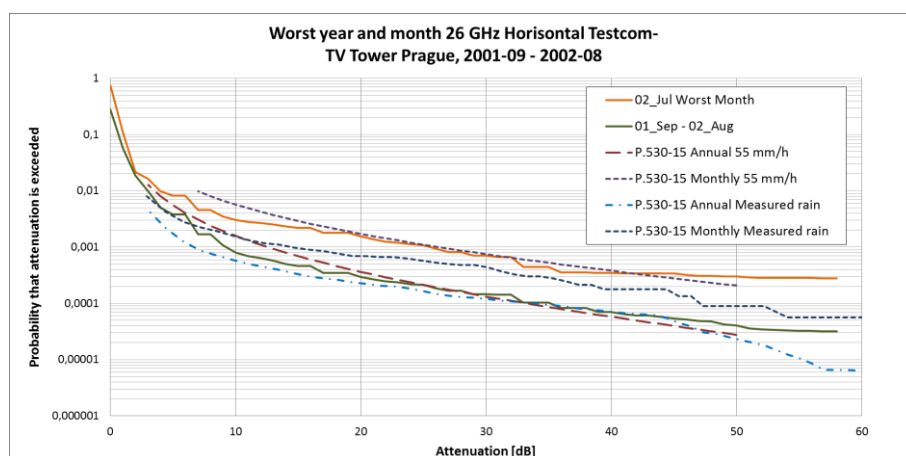

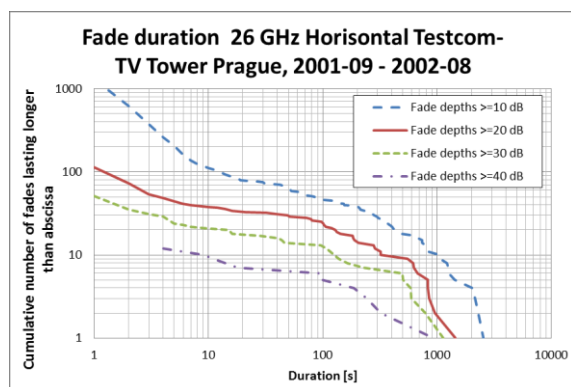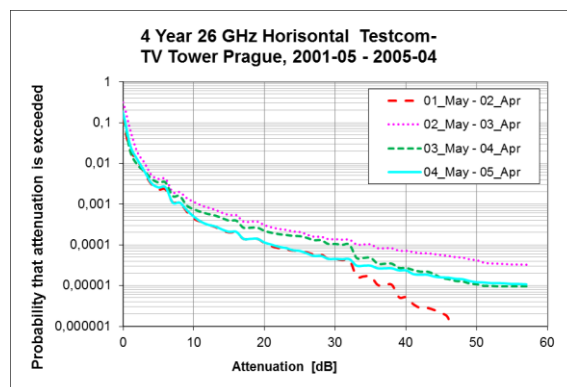**Figure 1 Worst year and month fade statistics versus prediction models**

Figure 2 Worst year fade duration

Figure 3 Year-by-year fade statistics