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COMMENTS AND CORRECTIONS

Corrections to "Real-Time Vehicular Wireless System-Level Simulation"

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In the above article [1], we discovered an error in the specific version of the AIT real-time channel emulator [2] used for this article. The imaginary part of the channel impulse response was divided by 4, while the real part of the channel impulse response was correct. This was due to a mistake in the conversion from fixed point format 16.16 bits to 14.18 bits in the imaginary part of the discrete prolate spheroidal sequence coefficients. Hence, for Section V in [1], the following errata list applies[1]:

1) Page 23210:
   - Equation (31) and the two sentences before should be replaced with:
     "A quadrature phase shift keying (QPSK) modulation and a coding rate of $C = 1/2$ are used. The Rx modem report the noise power P_N and the signal power P for each received data frame. We show FER results with respect to the SNR ζ calculated as

$$\zeta = \mathbb{E}\{P - P_N\},$$

     averaging over all F transmitted frames."
2) Page 23211:
   - Figures 9–11 should be replaced by Figs. 9–11 from this correction.
   - The complete text in Section V-A3, discussing the results of Fig. 11, should be replaced with: "In Fig. 11, we show the FER performance for different Doppler bandwidth values. In the NLOS case, the best FER performance is obtained for the Doppler bandwidth of 100 Hz, which is the lowest one. Increasing the Doppler bandwidth leads to higher RMS Doppler spreads and higher FERs. The reason is that a higher Doppler bandwidth results in a faster change of the channel impulse response, which, in turn, leads to increased

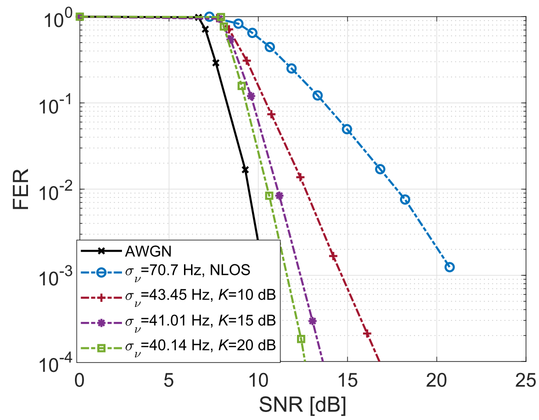

FIGURE 9. Measurement results of FER vs. SNR using an exponential PDP with K-factors $K \in \{-\infty, 10, 15, 20\}$ dB, RMS delay spread of 82 ns and Doppler bandwidth $f_{\text{Dmax}} = 100$ Hz, having $f_{\text{LOS}} = 0$ Hz.

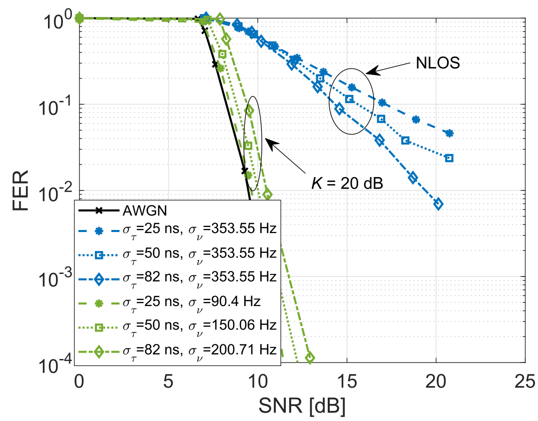

FIGURE 10. Measurement results of FER vs. SNR using an exponential PDP with RMS delay spread $\sigma_\tau \in \{25, 50, 82\}$ ns, K-factors $K \in \{-\infty, 20\}$ dB and Doppler bandwidth $f_{\text{Dmax}} = 500$ Hz, having $f_{\text{LOS}} = 0$ Hz.

[1] The complete article including all corrections can be found on arXiv https://arxiv.org/abs/2012.12331

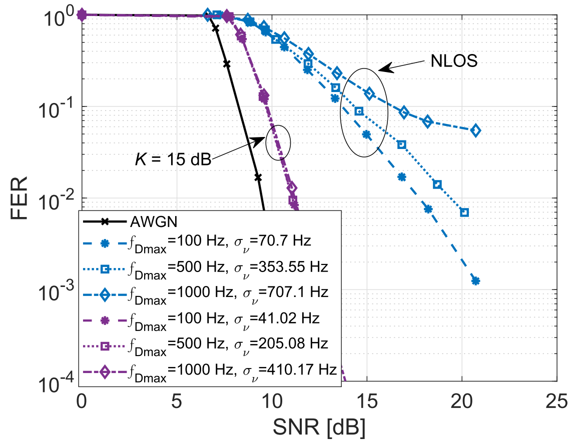

FIGURE 11. Measurement results of FER vs. SNR using an exponential PDP with Doppler bandwidth $f_{\mathrm{Dmax}} \in \{100, 500, 1000\}$ Hz, K-factors $K \in \{-\infty, 15\}$ dB and RMS delay spread $\sigma_\tau = 82$ ns, having $f_{\mathrm{LOS}} = 0$ Hz.

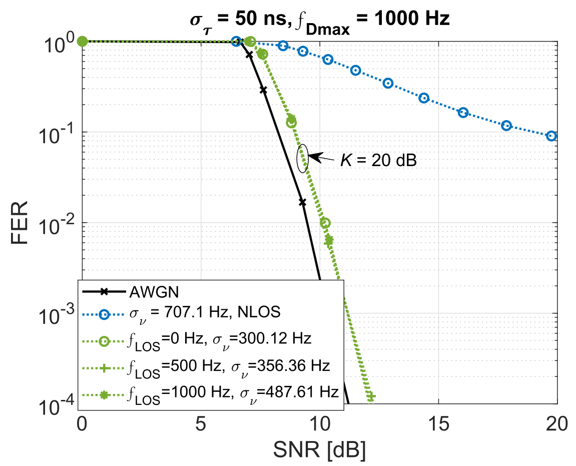

FIGURE 12. The FER vs. SNR measurement results for a Doppler bandwidth of 1000 Hz and RMS delay spread of 50 ns with $f_{\mathrm{LOS}} = [0, \frac{f_{\mathrm{Dmax}}}{2}, f_{\mathrm{Dmax}}]$. All results are compared with the FER for a pure Rayleigh fading (NLOS).

channel estimation errors [9]. This is a well-known limitation of the IEEE 802.11p pilot pattern as discussed in detail in [3], [22], [23]. In the LOS case, due to the strong LOS component, we see no impact of the different Doppler bandwidth values on the FER."

- The last five sentences in Section V-A4, discussing the results of Fig. 12, should be replaced with:

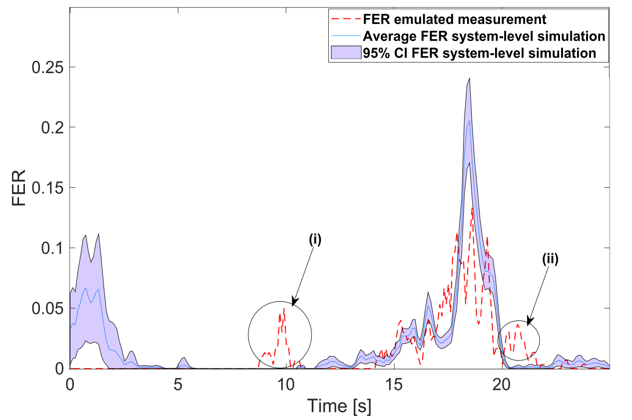

FIGURE 16. FERs obtained using the FER lookup table using our GSCM compared to the FERs obtained by emulating a measurement conducted for an inner city intersection scenario.

"The results show that the Doppler shift of the LOS component has no impact on the FER. Hence, in all strong LOS scenarios the carrier frequency offset compensation of the modem works reliably and provides close to AWGN performance."

3) Page 23212:
   - Figure 12 should be replaced by Fig. 12 from this correction.
4) Page 23213:
   - Figure 16 should be replaced by Fig. 16 from this correction.
   - The second last paragraph in the left column should be replaced with:
     "Fig. 16 shows the average FER obtained by system-level simulation (solid line), the corresponding 95% confidence interval (CI) (shaded area, contoured by a black solid line) and the FER we obtained by emulating the measurement data (dashed line)."

REFERENCES

[1] A. Dakić, M. Hofer, B. Rainer, S. Zelenbaba, L. Bernado, and T. Zemen, "Real-time vehicular wireless system-level simulation," *IEEE Access*, vol. 9, pp. 23202–23217, 2021.

[2] M. Hofer, Z. Xu, D. Vlastaras, B. Schrenk, D. Löschenbrand, F. Tufvesson, and T. Zemen, "Real-time geometry-based wireless channel emulation," *IEEE Trans. Veh. Technol.*, vol. 68, no. 2, pp. 1631–1645, Feb. 2019.