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Update on Electrical Balance Duplexer Performance in High Speed Rail Applications

Our previous TD, TD(16)02038, presented results from electrical balance duplexer (EBD) circuit simulations with dynamic antenna reflection coefficient data measured on board a high speed train. In this TD, we report extensions of our previous work, presenting a comparison of simulation results from two train types: a British Rail High Speed Train (HST) (presented in previous TD), and a British Rail Class 158 train. Simulation results show that passing trains can influence the antenna reflection coefficient and cause variation in the duplex isolation provided by the EBD. Variation was more substantial on board the class 158 trains, due to the narrower separation between passing trains compared to the HST. However in all scenarios, it was noted that re-balancing the EBD at intervals of 5 ms is sufficient to maintain performance.

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