

Abstract

The growing number of sensors and their applications in today's vehicles is giving rise to new automotive bus systems. Next-generation automotive bus systems must respond to the emerging requirements of achieving higher data rates, support heterogeneous sub-systems and use cases, while maintaining cost-efficient implementation. The traditional existing bus systems such as CAN and FlexRay can't meet those requirements. In contrast, faster candidates for future bus systems like MOST and Ethernet impose high costs and still falling short in terms of achievable data rates. Within the framework of the ERIKA project at TU-Chemnitz, the OFDM technology is being investigated as a candidate for the next-generation automotive bus system. In this work, we compare OFDM to FBMC in the context of the automotive bus system with a focus on the equalization techniques. Real-world measurements and a simulation model are integrated to analyze the communication channel, and low-complexity equalization methods for OFDM and FBMC are evaluated in different scenarios. Furthermore, An analysis of the simulation results is provided, taking into consideration the requirements of modern automotive communications.

Keywords: FBMC, OQAM, OFDM, Equalization, Automotive Bus