System-Level Assessment of Volumetric 3D Vehicular MIMO Antenna Based on Measurement

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Abstract:

This paper presents the evaluation of a volumetric 3D multi-element antenna for vehicular connectivity based on a system-level approach. First, the antenna design to be used in Long Term Evolution (LTE) networks and its realization based on molded interconnect device (MID) technology are shown. During the antenna evaluation, system-level key performance indicators (KPI) like condition number and channel capacity are investigated and are compared to indicators like return loss, inter-element coupling and radiation characteristics. System-level KPI include effects due to vehicular antenna integration or channel conditions, which have an impact on the overall performance. A suitable 2D reference antenna arrangement is developed to evaluate the performance gain of the volumetric antenna design approach by performing test drives in a live LTE network.