

*Abstract*—This paper considers the use of massive multiple input, multiple output (MIMO) combined with single-carrier with frequency-domain equalization (SC-FDE) modulations using a precoding approach. Although millimeter wave (mm-Wave) communications are expected to be a key part of 5G, these frequencies present considerable challenges due to high propagation free-space path losses and implementation difficulties. For this reason, it is desirable to have broadband mm-Wave communications with good power and spectral efficiencies that are compatible with high efficiency amplification. In this paper we propose a massive MIMO (m-MIMO) architecture for broadband mm-Wave communications using precoding approach. We consider three different types of precoding algorithms: Zero Forcing Transmitter (ZFT), Maximum Ratio Transmitter (MRT), and Equal Gain Combiner (EGT). The advantage of both MRT and EGT relies on avoiding the computation of pseudo-inverse of matrices. Their performance of MRT and EGT can be very close to the matched filter bound just after a few iterations of a new proposed interference cancellation, even when the number of receive antennas is not very high.

*Keywords*—Massive MIMO, precoding, SC-FDE, 5G, Interference Cancellation, mm-Wave.