

In massive multiple-input multiple-output (MIMO), most precoders result in downlink signals that suffer from high peak-to-average ratio (PAR), independently of modulation order and whether single-carrier or orthogonal frequency-division multiplexing (OFDM) transmission is used. The high PAR lowers the power efficiency of the base-station amplifiers. To increase the power efficiency, low-PAR precoders have been proposed. In this paper, we compare different transmission methods for massive MIMO in terms of the power consumed by the amplifiers. It is found that: 1) OFDM and single-carrier transmission have the same performance over a hardened massive MIMO channel and 2) when the higher amplifier power efficiency of low-PAR precoding is taken into account, conventional and low-PAR precoders lead to approximately the same power consumption. Since downlink signals with low PAR allow for simpler and cheaper hardware, than signals with high PAR, therefore, the results suggest that low-PAR precoding with either single-carrier or OFDM transmission should be used in a massive MIMO base station.