

Abstract

Massive multiple input, multiple output (MIMO) schemes have been considered to support the physical layer of 5G systems and its combination with single-carrier with frequency-domain equalization (SC-FDE) schemes is particularly interesting for the uplink. However, the receiver complexity increases with the number of antennas, and it is important to have low complexity massive MIMO schemes. In this paper we consider the receiver design for the uplink of massive MIMO schemes where SC-FDE techniques are employed by the user terminals. To achieve this, we employ low resolution analog-to-digital converters (ADCs) at each receive branch of the BS, combined with low complexity FDE techniques. It is shown that, although the nonlinear distortion levels inherent to the use of low resolution ADCs can be very high, we can have excellent performance, even with low complexity FDE receivers, provided that the number of receiver antennas is higher than the number of user terminals.