Dear Editor

I am submitting our manuscript titled "DHT Precoded MIMO-OFDM System with Large-Size Constellation" for possible publication in your high quality journal. This paper uses a discrete Hartley transform (DHT) as a unitary precoder in the multiple input-multiple output (MIMO) orthogonal frequency division multiplexing (OFDM). The performance is evaluated over multipath international telecommunication union (ITU) frequency selective fading channels when large size data mapping were used. Simulation results using Matlab showed that using DHT as a precoder significantly explore the channel capacity and improve the bit-error-rate (BER) and channel capacity in comparison to the classic MIMO-OFDM that is not using a precoder. This manuscript also presents a mathematical formula to the BER performance of DHT precoded MIMO-OFDM over multipath channels.

There has been a plethora of research presented supporting that the MIMO-OFDM can significantly explore the multipath diversity if a proper designed precoder is used [1, 6]. [1, 3] designed a precoder at the transmitter based on the channel elements. The system throughput of this approach is low due to the feedback 1 link that is used for the channel. It also required further complexity and hard to apply when the channel is fast fading. A unitary precoder with limited feedback was designed for spatial multiplexing MIMO-OFDM [4]. In [6], a channel independent unitary precoder was presented. The main drawback of this approach is its high complexity as it is required extra transforms at the transmitter and receiver. To solve this problem, we presented in our previous work [7] a discrete Hartley transform (DHT) as a unitary precoder for Alamouti space time (ST-OFDM) where both the precoder transform and modulation transform of the OFDM emerged into single unitary low complexity transform. However, the system in [7] does not include channel capacity, has not introduced a mathematical formula for the bit-error-rate (BER) performance and it was not generalized to MIMO with massive antennas.

The contribution of this manuscript is
- Introducing the DHT transform as a precoder in MIMO-OFDM systems
- Presenting a mathematical model for the BER performance of the DHT precoded MIMO-OFDM over multipath frequency selective fading channels with N_T transmit and N_r receive antennas.
- Calculating the channel capacity of the DHT precoded MIMO-OFDM and compared it with conventional MIMO-OFDM.

We believe that this work is a novel, hence wae submit it to your high standard journal for possible publication in your journal.

Your sincerely
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