INTERPOLATION−BASED MULTI−MODE PRECODING FOR MIMO−OFDM SYSTEMS (ThuAmOR4)

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Abstract :

Spatial multiplexing with multi−mode precoding provides a means to achieve both high capacity and high reliability in multiple−input multiple−output orthogonal frequency division multiplexing (MIMO−OFDM) systems. Multi−mode precoding uses linear transmit precoding that adapts the number of spatial multiplexing data streams or modes, according to the transmit channel state information (CSI). To do so, it typically requires complete knowledge of the transmit precoding matrices for each subcarrier at the transmitter. In this paper, we propose to reduce the transmit CSI requirements to only the precoding matrices on a fraction of the subcarriers. We use interpolation to recover the missing precoders followed by mode selection to enforce the optimal spatial multiplexing mode on all subcarriers. Three interpolation solutions are presented, which reduce the transmit CSI requirements of multi−mode precoding and yet still outperform fixed spatial multiplexing in a variety of channel models and number of pilots.

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