MIMO-OFDM COMPARISON WITH RESPECT TO CHANNEL ASSESSMENT

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ABSTRACT

With the ever increasing number of wireless subscribers and their seemingly “greedy" demands for high-data-rate services, radio spectrum becomes an extremely rare and invaluable resource for all the countries in the world. Efficient use of radio spectrum requires that modulated carriers be placed as close as possible without causing any ICI and be capable of carrying as many bits as possible. Optimally, the bandwidth of each carrier would be adjacent to its neighbors, so there would be no wasted bands. In practice, a guard band must be placed between neighboring carriers to provide a guard space where a shaping filter can attenuate a neighboring carrier's signal. These guard bands are waste of spectrum. In order to transmit high-rate data, short symbol periods must be used. The symbol period *Tsym* is the inverse of the baseband data rate R ($R = 1=Tsym$), so as R increases, *Tsym* must decrease. In a multipath environment, however, a shorter symbol period leads to an increased degree of ISI, and thus performance loss. OFDM addresses both of the two problems with its unique modulation and multiplexing technique. OFDM divides the high-rate stream into parallel lower rate data and hence prolongs the symbol duration, thus helping to eliminate ISI. It also allows the bandwidth of subcarriers to overlap without ICI as long as the modulated carriers are orthogonal. OFDM therefore is considered as a good candidate modulation technique for broadband access in a very dispersive environment**.**

KEYWORDS: Channel estimation, Transmission paths, normalization factor, gain capacity.