

BROADBAND CDMA TECHNIQUES

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ABSTRACT

A very high-speed wireless access of 100Mbps to 1Gbps is required for the 4th generation (4G) mobile communications systems. However, for such high-speed data transmissions the channel is severely frequency-selective due to the presence of many interfering paths with different time delays. A promising wireless access technique that can overcome the channel frequency-selectivity and even take advantage of this selectivity to improve the transmission performance is code division multiple access (CDMA). There may be two approaches in CDMA technique: direct-sequence (DS)-CDMA and multi-carrier (MC)-CDMA. A lot of attention is paid to MC-CDMA. However, recently it has been found that DS-CDMA can achieve a good performance comparable to MC-CDMA if proper frequency-domain equalization is adopted. This presentation discusses their similarities and performances. A major transmission mode in 4G systems will be packet based. Automatic repeat request (ARQ) combined with channel coding is a very important technique. A recent research activity about this technique is also introduced.