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# Frequency synchronization algorithms for OFDM systems suitable for communication over frequency selective fading channels

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### Abstract:

In this paper, the problem of carrier synchronization of OFDM systems in the presence of a substantial frequency offset is considered. New frequency estimation algorithms for the data aided (DA) mode are presented. The resulting two stage structure is able to cope with frequency offsets in the order of multiples of the spacing between subchannels. Key features of the novel scheme-which are presented in terms of estimation error variances, the required amount of training symbols and the computational load-ensure high speed synchronization with negligible decoder performance degradation at a low implementation effort.

**Published in:** Vehicular Technology Conference, 1994 IEEE 44th

**Date of Conference:** 8-10 June 1994

**INSPEC Accession Number:** 4846897

**Date Added to IEEE Xplore:** 06 August 2002

**DOI:** 10.1109/VETEC.1994.345377

**ISBN Information:**

**Publisher:** IEEE

**Print ISSN:** 1090-3038

**Conference Location:** Stockholm, Sweden,

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### Keywords

#### IEEE Keywords

Frequency synchronization, Fading, Degradation, OFDM modulation, Additive white noise, Frequency estimation, Gaussian noise, AWGN, Filters, Estimation error

#### INSPEC: Controlled Indexing

telecommunication channels, synchronisation, frequency estimation, frequency division multiplexing, fading

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orthogonal frequency division multiplexing, frequency synchronization algorithms, OFDM systems, communication, frequency selective fading channels, carrier synchronization, frequency offset, frequency estimation algorithms, data aided mode, two stage structure, subchannels, estimation error variances, training symbols, computational load, decoder performance degradation

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