

**PENGUJIAN TEKNIK FAST CHANNEL SHORTENING
PADA MULTICARRIER MODULATION
DENGAN METODA POLYNOMIAL WEIGHTING
FUNCTIONS**

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ABSTRAK

Dewasa ini, modulasi *multicarrier* dipilih sebagai skema transmisi untuk sebagian besar sistem komunikasi baru.

Salah satu kelebihan dari sistem *multicarrier* adalah tahan terhadap *multipath* (atau *delay spread* pada kasus *wireline*) dengan syarat bahwa *delay spread* cocok dalam *guard interval* yang ditentukan sebelumnya. Panjang *guard interval* adalah tetap dan lebih pendek dari panjang blok. Dalam beberapa kasus, panjang kanal dapat melebihi panjang *guard interval*. Dalam kasus ini, *equalizer* digunakan untuk membuat suatu kanal efektif sehingga panjang kanal efektif menjadi lebih pendek dari *guard interval*.

Desain *Time Domain Equalizer* (TEQ) *Minimum Interblock Interference* (Min-IBI) dan TEQ *Minimum Delay Spread* (MDS) menggunakan metoda *polynomial weighting functions*.

Kata kunci: multicarrier, multipath, delay spread, guard interval, equalizer, Minimum Interblock Interference, Minimum Delay Spread dan polynomial weighting functions.

FAST CHANNEL SHORTENING TECHNIQUE EVALUATION ON MULTICARRIER MODULATION WITH POLYNOMIAL WEIGHTING FUNCTIONS

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ABSTRACT

Nowadays, multicarrier modulation selected as a transmission scheme for the majority of new communications systems.

One of the advantages of the multicarrier system is resilient to multipath (or delay spread at the wireline case) on condition that the delay spread fits in predetermined guard intervals. The length of guard interval is fixed and shorter than the length of the block. In some cases, the channel length may exceed the length of the guard interval. In this case, the equalizer is used to create an effective channel so that the effective channel length becomes shorter than the guard interval.

Minimum Interblock Interference (Min-IBI) Time Domain Equalizer (TEQ) and the Minimum Delay Spread (MDS) TEQ design using the polynomial weighting functions method.

Keywords: multicarrier, multipath, delay spread, guard interval, equalizer, Minimum Interblock Interference, Minimum Delay Spread and polynomial weighting functions.

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LAMPIRAN A : M-File Matlab

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DAFTAR SINGKATAN

| | | |
|---------|---|--|
| TEQ | : | Time Domain Equalizer |
| Min-IBI | : | Minimum Inter-Block Interference |
| MDS | : | Minimum Delay Spread |
| DSL | : | Digital Subscriber Line |
| DVB | : | Digital Video Broadcast |
| DAB | : | Digital Audio Broadcast |
| SDARS | : | Satellite Digital Audio Radio Service |
| PLC | : | Power Line Communications |
| OFDM | : | Orthogonal Frequency Division Multiplexing |
| DMT | : | Discrete Multi Tone |
| CW | : | Carrier Wave |
| FDM | : | Frequency Division Multiplexing |
| DFT | : | Discrete Fourier Transform |
| BPSK | : | Binary Phase Shift Keying |
| IFFT | : | Inverse Fast Fourier Transform |
| FFT | : | Fast Fourier Transform |
| AWGN | : | Additive White Gaussian Noise |
| PDF | : | Probability Density Function |
| P/S | : | Paralel to Serial |
| S/P | : | Serial to Paralel |
| CP | : | Cyclic Preifix |
| xCP | : | Remove Cyclic Prefix |
| QAM | : | Quadrature Amplitude Modulation |

| | | |
|-------|---|--|
| FEQ | : | Frequency Domain Equalizer |
| ISI | : | Intersymbol Interference |
| ICI | : | Intercarrier Interference |
| IDFT | : | Inverse Discrete Fourier Transform |
| FIR | : | Finite Impulse Response |
| MSSNR | : | Maximum Shortening Signal to Noise Ratio |
| MMSE | : | Minimum Mean Square Error |
| LAN | : | Local Area Network |
| QPSK | : | Quadrature Phase Shift Keying |