OFDM Glossary (and Channel Parameters)

numbers

N_c — number of subcarriers

$N > N_c$ — transform size (data-symbol samples)

$N_c = 0.6\,N$ — typical subcarrier apportionment

N_{cp} — cyclic prefix samples

$N_L = N + N_{cp}$ — total samples per OFDM symbol

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time

T_L — sample time

$T_s = (N \times T_L)$ — symbol time (data portion)

T_{cp} — cyclic prefix time

$T_{cp} = 0.25\,T_s$ — typical CP apportionment

$T_{\text{OFDM}} = (T_s + T_{cp}) = (N_L \times T_L)$ — OFDM symbol time

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frequency

$\Delta f = 1/T_s$ — frequency difference between adjacent subcarriers

$f_s = (N \times \Delta f) = 1/T_L$ — sample rate

$W_{\text{signal}} = (N_c + 1)\,\Delta f$ — OFDM modulation BW

Channel parameters:

T_m — max multipath delay

σ_τ — rms multipath delay

$f_0 \approx 1/T_m$ — coherence BW

$f_0(50\%) \approx 1/5\sigma_\tau$ — coherence BW over which the spectral correlation is at least 0.5

f_d — fading rate (Doppler spectral spreading)

$T_0 = \dfrac{0.5\,\lambda}{\text{velocity}}$

$T_0 \approx 1/f_d$ — coherence time