Glossary of Symbols

Symbol	Definition
1G	First Generation
2G	Second Generation
3G	Third Generation
3GPP	Third Generation Partnership Project
AMPS	Analog Advance Mobile Phone Service
AWGN	Additive White Gaussian Noise
BER	Bit Error Rate
CDMA	Code Division Multiple Access
CEF	Channel Estimation Filter
CIR	Channel Impulse Response
DPCH	Dedicated Physical Channel
DPCCH	Dedicated Physical Control Channel
DPDCH	Dedicated Physical Data Channel
FDD	Frequency Division Duplex
FDMA	Frequency Division Multiple Access
FPGA	Field Programmable Gate Array
GSM	Global System for Mobile Communication
ITU	International Telecommunication Union
MRC	Maximum Ratio Combining
OVSF	Orthogonal Variable Spreading Factor
QPSK	Quadrature Phase Shift Keying
SF	Spreading Factor
SNR	Signal-to-Noise Ratio
TDMA	Time Division Multiple Access
WCDMA	Wide-Band Code Division Multiple Access
WMSA	Weighted Multi-Slot Moving Average
$s(t)$	The transmitted equivalent baseband signal
β	The relative power level of dedicated physical control channel to dedicated physical data channel
d_d	The information streams of dedicated physical data channel channel
d_c	The information streams of dedicated physical control channel
$w_c(t)$	The orthogonal spreading code of dedicated physical control channel
$w_d(t)$	The orthogonal spreading code of dedicated physical data channel
$c(t)$	The complex scrambling code waveform of the user
h_l	The impulse response of the l^{th} path signal
$\alpha_l(t)$	The amplitude of the l^{th} path signal
$\phi_l(t)$	The phase response of the l^{th} path signal
$\alpha_{r,l}(t)$	The amplitude of the scattered components of the l^{th} path signal
$\phi_{r,l}(t)$	The phase response of the scattered components of the l^{th} path signal

$\alpha_{d,l}(t)$	The amplitude of the direct-path components of the l^{th} path signal
$\phi_{d,l}(t)$	The phase response of the direct-path components of the l^{th} path signal
P_l	The power of the direct-path ray of the l^{th} path signal
θ_l	The arrival angle of the direct-path ray of the l^{th} path signal
f_d	The maximum Doppler frequency
f_c	The carrier frequency
c	Speed of the light
v	Speed of the mobile phone
$h(t)$	The channel impulse response
L	the total number of resolvable paths
$\delta(t)$	Dirac delta function
t_l	The time delay of l^{th} resolvable path
W	The bandwidth of the channel
T_m	The multipath spread
L_m	The maximum number of possible multipath signal components
$r_l(t)$	The received l^{th} path signal
$r(t)$	The total received signal
$n(t)$	The background additive white Gaussian noise
$i(t)$	The interference from other users
$C(m,l)$	Correlation result at l^{th} delay sample of m^{th} frame
d_{pilot}	The pilot data at n^{th} bit
L_T	An index of maximum time delay
N	The window size of correlation
τ_{max}	The maximum time delay
T_{chip}	Time interval of one chip duration
$z(l)$	The average power delay profile
θ	The threshold value
α_{TH}	The constant values
Z_{max}	The highest power of averaged power delay profile
β_{NTT}	The constant value used in NTT method which is equal to 3 dB
Z_{min}	The lowest power of averaged power delay profile
$m_{z,noise}$	A proportional of power profile only noise paths
$\gamma_{z,noise}$	A standard deviation of power profile only noise paths
σ	A parameter which is able to select from working test
c_z	The constant value which is equal to 0.5
a	A parameter depending on designing
b	A parameter depending on designing
m_z	A proportional of averaged power delay profile
N_s	A number of instantaneous power delay profile which will be averaged to find the averaged power delay profile
M_L	The total number of rake fingers in the rake receiver
M	The total number of frames used in the averaging power delay profile process
$r_{l,Descramb}$	The unscrambled of l^{th} path signal
Z_l	Thermal noise and interferences from other users
T_c	The symbol duration of dedicated physical control channel
E_c	The transmitted energy via the dedicated physical control channel
T_{cslot}	The slot length for dedicated physical control channel
T_d	The symbol duration of dedicated physical data channel
$r_{l,DPDCH}(n_d)$	The despreaded signal of dedicated physical data channel from l^{th} path signal at n_d^{th} bit

$r_{l,DPCCH}(i, n_c)$	The despreaded signal of dedicated physical control channel from l^{th} path signal at n_c^{th} bit of i^{th} slot
$h_{est,l}$	The estimated channel impulse response of l^{th} after despreading
d_{pilot}	The demultiplexed pilot symbols in the dedicated physical control channel
K	The variable used in a linear filter which is a positive integer
α	The channel impulse response after noise cancelling
$\hat{h}_{est,l}$	A remaining estimated channel impulse response calculated by the weighted multi-slot averaging channel estimator
λ_k	The positive integer used in the weighted multi-slot averaging channel estimator
N_p	The number of pilot symbols in the dedicated physical control channel
N_D	The number of data symbols in the dedicated physical control channel
$y_{l,DPCCH}$	The estimated data symbol in dedicated physical control channel after channel equalizing
$y_{l,DPDCH}$	The estimated data symbol in dedicated physical data channel after channel equalizing
d_I	The decoded data symbol after maximum ratio combining in dedicated physical data channel
d_Q	The decoded data symbol after maximum ratio combining in dedicated physical control channel