Spatial Modulation Enhancement Using Non-Orthogonal Multiple Access, Codebook-based Precoding and New Single RF Models

by

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LIST OF ABBREVIATIONS

1G	First Generation
4G	Fourth Generation
5G	Fifth Generation
AFFC	Average Filtration Full-Combination
AS	Antenna Selection
AWGN	Additive White Gaussian Noise
BER	Bit Error Rate
BLAST	Bell Labs layered space-time
BS	Base Station
BPSK	Binary Phase Shift Keying
CC	Cell-center
CDF	Cumulative Distribution Function
CDMA	Code Division Multiple Access
CE	Cell-Edge
CP	Codebook-based Precoding
CSI	Channel State Information
CSIR	CSI at the receiver
CSIT	CSI at the Transmitter
CWS	Codeword Selection
D-BLAST	Diagonal BLAST
ED	Euclidean Distance
EE	Energy Efficiency
eMBB	enhanced Mobile Broadband
ESINR-PA	Equal Signal to Interference plus Noise Ratio

ESM	Enhanced Spatial Modulation
FA	Finite Alphabet
FC	Full-Combination
FFC	Factorized FC
FD	Full Detector
FDD	Frequency Division Duplex
FDMA	Frequency Division Multiple Access
FFC	Factorized Full-Combination
GED	Guaranteed ED
GSM	Generalization of SM
GSSK	Generalized SSK
ICI	Inter-Channel Interference
HCP	Hybrid-CP
IAS	Inter-Antenna Synchronization
ICSI	Instantaneous CSI
IFFC	Index Filtration Full-Combination
i.i.d.	identical and independently distributed
IOT	Internet of Things
IUI	Inter-User Interference
IS	Iterative Search
LA	Link Adaption
LCSI	Long-term Characteristics of CSI
LSM	Layered SM
LTE	Long Term Evolution
LTE-A	Long Term Evolution-Advance
MC	Monte Carlo
MED	Minimum Euclidean Distance
MI	Mutual Information

MIMO	Multiple Input Multiple Output
MISO	Multiple Input Single Output
MLD	Maximum Likelihood Detector
mMTC	massive Machine Type Communication
MU	Multi-User
MRF	Multi-Radio Frequency
MMD	minimum MED
MSSK	M-ary Space Shift Keying
NCP	Non-Codebook-based Precoding
NOMA	Non-Orthogonal Multiple-Access
NP	Non-deterministic Polynomial-time
NSD	Next SM Detector
OAT	Orthogonal Array Testing
OFDMA	Orthogonal Frequency Division Multiple Access
PA	Power Allocation
PDF	Probability Density Function
PRP	Phase Rotation Precoding
PSK	Phase Shift Keying
QAM	Quadrature Amplitude Modulation
QOS	Quasi-Orthogonal Sequences
QPSK	Quadrature PSK
QSM	Quadrature Spatial Modulation
RA	Receive Antenna
RAS	RA Selection
RF	Radio Frequency
RHS	Right Hand Side
Rx	Receiver
SC	Superposition Coding

SC-FDMA	Single Carrier-Frequency Division Multiple Access
SE	Spectral Efficiency
SER	Symbol Error Rate
SFF	Statistically Filtered Full-Combination
SIC	Successive Interference Cancellation
SIMO	Single Input Multiple Output
SINR	Signal to Interference plus Noise Ratio
SISO	Single Input Single Output
SM	Spatial Modulation
SMx	Spatial Multiplexing
SNR	Signal to Noise Ratio
SRF	Single-Radio Frequency
SRFC1	*SRF-Case1*
SRFC2	*SRF-Case2*
SRFGen	Generalized SRF
SS	Symbol Selection
SSK	Space Shift Keying
STC	Space-Time-Coding
SU	Single-User
TA	Transmit Antenna
TAS	TA Selection
TAG	Transmit Antenna Grouping
TDMA	Time Division Multiple Access
TP	Transmit Precoding
TR	Transmission Rate
Tx	Transmitter
TTD	Time Division Duplex
UE	User Equipment

ULA	Uniform Linear array
URA	Uniform Rectangular Array
URLLC	Ultra-reliable low latency communication
VBLAST	Vertical Bell Labs Layered
V2V	Vehicle to Vehicle
WH	Walsh-Hadamard