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List of Abbreviations

CPW	Coplanar Waveguide
SP	Surface Plasmon
SPP	Surface Plasmon Polariton
SSPPs	Spoof Surface Plasmon Polaritons
EM	Electromagnetic
LWAs	Leaky-Wave Antennas
SIW	Substrate Integrated Waveguide
CST	Computer Simulation Technology
TEM	Transverse Electro-Magnetic
3-D	Three Dimensional
2-D	Two Dimensional
1-D	One Dimensional
MIMO	Multiple-Input-Multiple-Output
TL	Transmission Line
ECC	Envelope Correlation Coefficient
TARC	Total Active Reflection Coefficient
CCL	Channel Capacity Loss
THz	Terahertz

EBG	Electromagnetic Band-Gap
MS	Metasurface
LPDA	Log-Periodic Dipole Array
ADS	Advanced Design Software
FBR	Front-to-Back Ratio
RA	Reflectarray
GBW	Gain Bandwidth
SPD	Spatial Phase Delay
TA	Transmit Arrays
AE	Aperture Efficiency
BS	Beam Scanning
FBW	Fractional Bandwidth,
PCB	Printed Circuit Board
UWB	Ultra-wideband
BPF	Band-pass Filter
SNR	Signal-to-noise Ratio
UV	Ultraviolet

List of Symbols

dB	Decibel
ϵ	Permittivity
ϵ_{eff}	Effective permittivity
ϵ_r	Relative permittivity
ϵ_h	Hole's permittivity
μ_h	Hole's permeability
c	Speed of light
ψ^R	Correlation matrix of the receiving antenna
k_0	Free space wave number
k_{sspp}	SSPPs wave number
k_x	X-direction wave number
$k_{ }$	Transverse wave number
K	Complete elliptic integral of the first kind
ω_p	Plasma frequency
ϕ_{spd}	Spatial phase delay
ϕ_{sp}	Successive phase
ϕ_{RA}	Phase shift on the reflectarray aperture
λ_0	Free space wavelength
λ_g	Guided wavelength
β_n	n^{th} harmonic wave number
β_{sspp}	SSPPs wave number
α	Attenuation constant
S_i	Separation between the feed antenna and the i^{th} element
\hat{s}_0	Beam direction
$\tan\delta$	Loss tangent
Γ_a^t	Total active reflection coefficient

