TABLE I

System parameter and explanation.

System parameter	Explanation
$\mathbf{H}_e$	Channel from Alice to Eve
$\mathbf{H}_b$	Channel from Alice to Bob (single-antenna Alice case: $\mathbf{h}_b$; single-antenna Bob case: $\mathbf{h}_b^{\mathrm{H}}$)
$\mathbf{H}$	Channel from Alice to IRS (single-antenna Alice case: $\mathbf{h}_0$)
$\mathbf{G}_r$	Channel from IRS to Bob (single-antenna Bob case: $\mathbf{h}^{\mathrm{H}}$)
$\mathbf{G}_e$	Channel from IRS to Eve
$\mathbf{\Phi}$	Phase shift matrix
α	Existence probability of the channel from Alice to Bob
β	Existence probability of the channel from Alice to Eve
$\mathbf{w}$	Beamforming vector
$\mathbf{b}$	Normalized beamforming vector
P	Actual transmission power
ρ	Transmission power constraint
x	Confidential information-bearing signal
$\theta_n \in [0, 2\pi)$	Phase introduced by the nth phase shifter element of IRS
N_t, N_e	The numbers of antennas at Alice and Eve
N_s	The number of programmable phase shifter elements
$\mathbf{n}$, $\mathbf{n}_e$	AWGN at Bob and Eve
σ^2, σ_e^2	Variances of AWGN at Bob and Eve
C_s, C_m, C_w	Secrecy rate, channel capacity of main channel, channel capacity of wiretap channel
R_s	Targeted PLS coding rate of Alice's encoder
P_{out}	Secrecy outage probability
ϵ	Accuracy requirement of the interior-point method
ζ	Accuracy requirement of conjugate-gradient descent algorithm
ξ	Accuracy requirement of alternating optimization algorithm