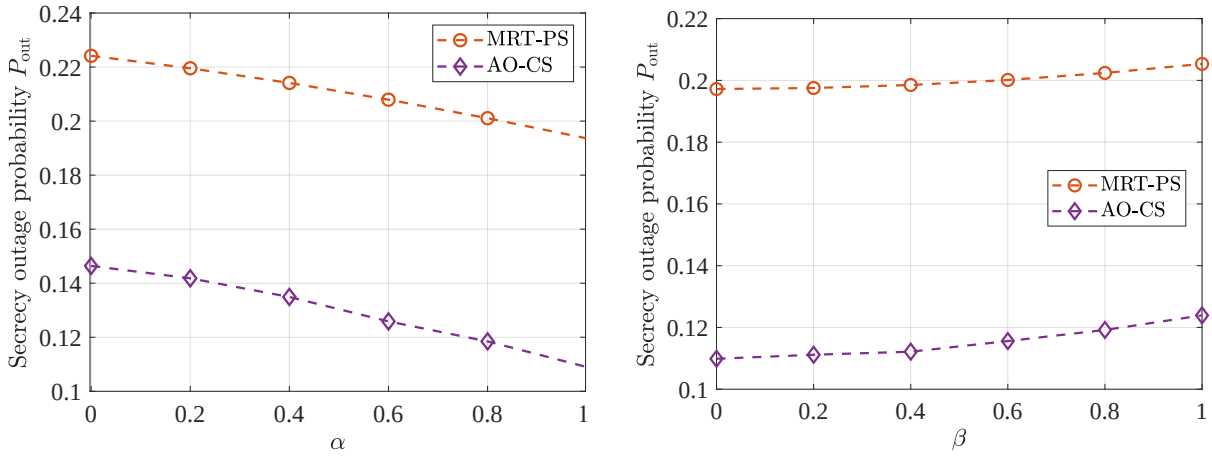
The simulation shows the secrecy outage probability in terms of α and β.



(a) $N_t = 10$, $N_e = 2$, $N_s = 32$, $\beta = 0.8$, SNR is 7 dB, and R_s is 3 bit/s/Hz.

(b) $N_t = 10$, $N_e = 2$, $N_s = 32$, $\alpha = 0.8$, SNR is 7 dB, and R_s is 3 bit/s/Hz.

Fig. 1. Secrecy outage probability in terms of the existence probabilities of the channel from Alice to Bob and the channel from Alice to Eve, i.e., α and β .

The impacts of α and β on the secrecy outage probability are shown in Fig. 1. From Fig. 1(a), we can find that the secrecy outage probability decreases with the increasing α, meaning the direct channels between Alice and Bob can reduce the secrecy outage probability. Fig. 1(b) shows that the larger existence probability of the channel from Alice to Eve will do harm to secure transmission as Eve has more opportunities to gather the signals from the direct channel between Alice and Eve.