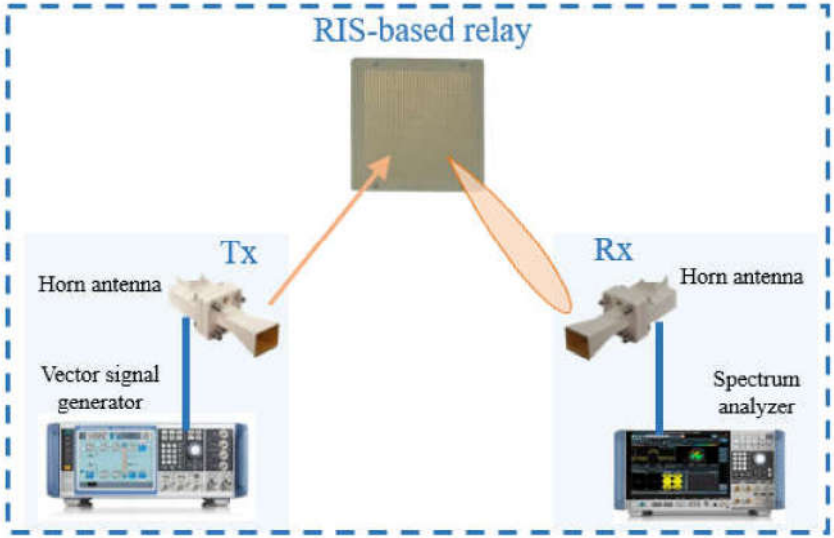
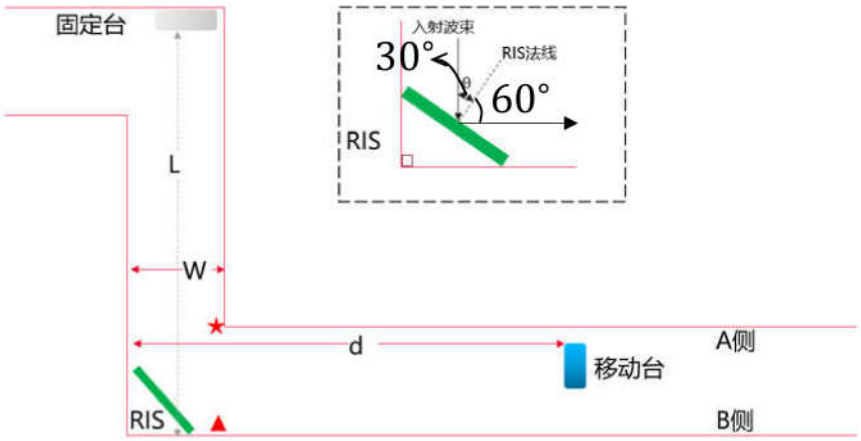
RIS-based relay

- **Performance indicator**
  - $$\frac{\text{received signal power using RIS}}{\text{received signal power without RIS}}$$
- **Communication Prototype**
  - **One Transmitter**
    - Vector signal generator (SMW200A): generate signal
    - Horn antenna
  - **One RIS:** work as relay
  - **One Receiver**:
    - Horn antenna
    - Spectrum analyzer (FSW): measure ACLR and EVM



RIS-based relay

- **Experimental setup**
  - L-shape corridor



  - Other parameters

Parameters	Value
Transmission frequency band	single-tone signal@26GHz
Transmit antenna gain	19 dBi
Transmit power	-7 dBm
Tx-RIS distance	0.5 m
Receive antenna gain	18 dBi

RIS-based relay

- **Experimental results**

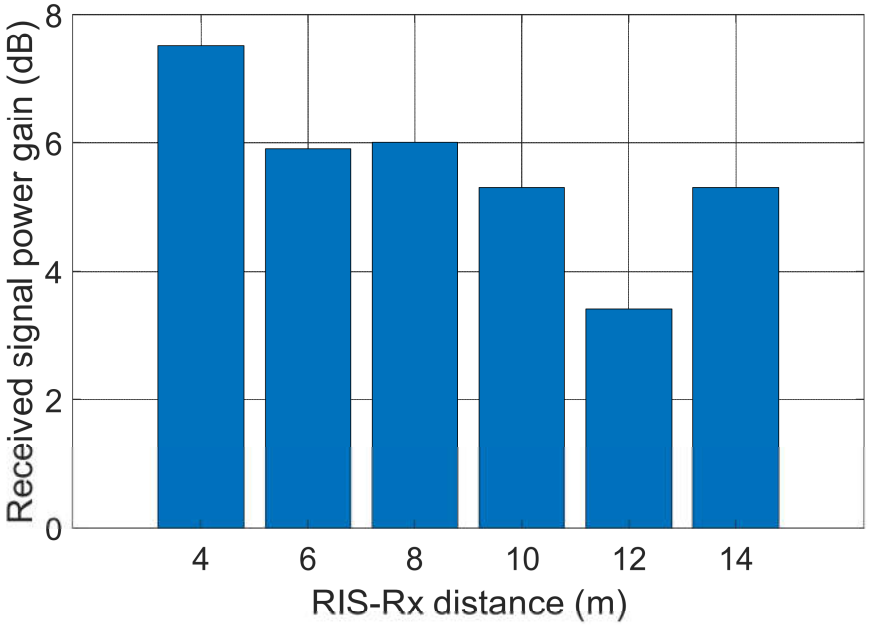


Fig. 1 Received signal power gain vs. RIS-Rx distance, with Rx located at **A**

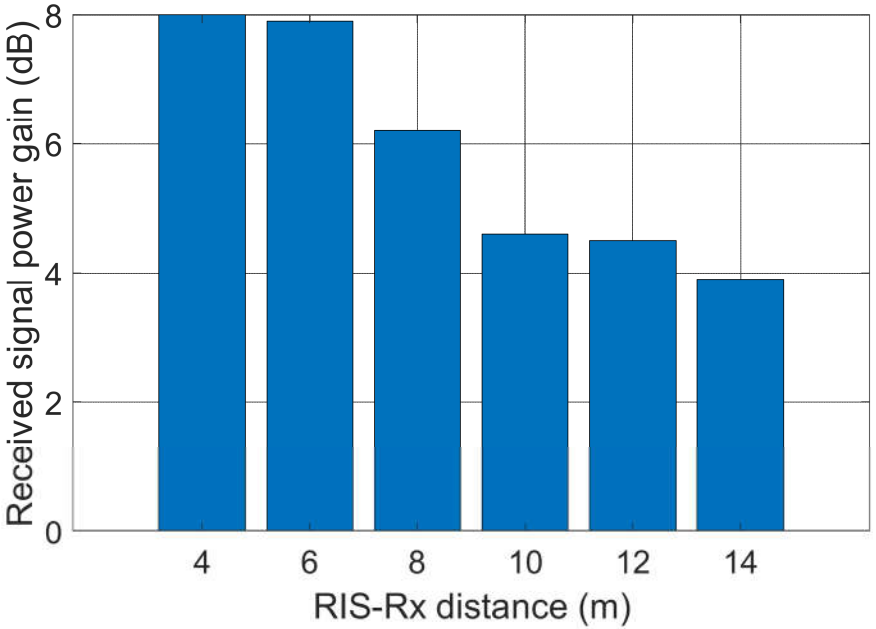


Fig. 2 Received signal power gain vs. RIS-Rx distance, with Rx located at **B**

- Conclusion: the RIS-enabled relay can always improve the received signal strength despite the location of the receiver.