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Project title: Intelligent Reflecting Surface Versus Decode-and-Forward: How Large Surfaces are Needed to Beat Relaying?

Proposed work: The rate and energy efficiency of wireless channels can be improved by deploying software-controlled metasurfaces to reflect signals from the source to the destination, especially when the direct path is weak.

While previous works mainly optimized the reflections, this letter compares the new technology with classic decode-and-forward (DF) relaying.

The main observation is that very high rates and/or large metasurfaces are needed to outperform DF relaying, both in terms of minimizing the total transmit power and maximizing the energy efficiency, which also includes the dissipation in the transceiver hardware.

The reference is listed below.

Reference

[1] E. Björnson, Ö. Özdogan and E. G. Larsson, "Intelligent Reflecting Surface Versus Decode-and-Forward: How Large Surfaces are Needed to Beat Relaying?," in *IEEE Wireless Communications Letters*, vol. 9, no. 2, pp. 244-248, Feb. 2020.