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Switched Loop Antenna for RFID Localization

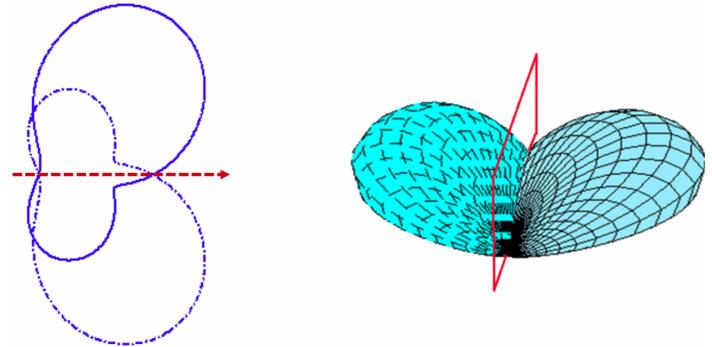
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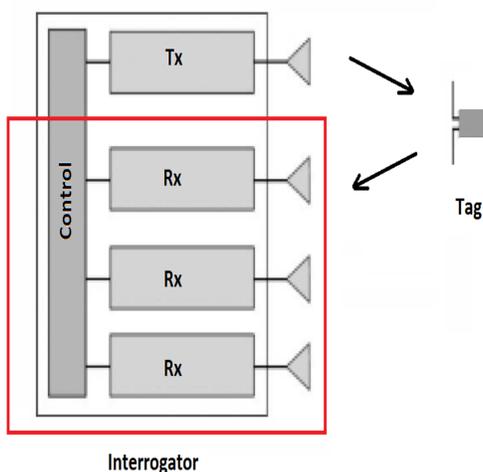
Introduction

- The poster suggests an approach for localizing tagged items by equipping the RFID tag with a low-complexity switched loop antenna.
- By controlling the polarity of a DC source sharing the RF path with the input signal, different beampatterns are triggered and different spatial responses are thus observed by the RFID reader.
- The different spatial signatures allow the RFID reader to estimate the direction of the tag with a single receive antenna at the reader's side.

Far-Field



State of the Art



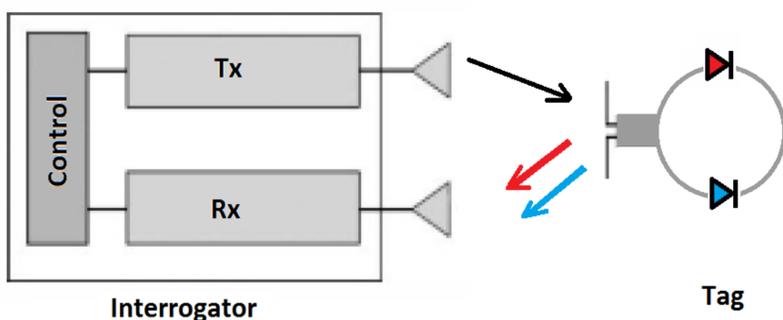
Far-Field, ctd'

$B_1(\Omega)$ and $B_2(\Omega)$ are weakly correlated beams

They are balanced (in the uniform 3D space) as forming a mirror-image pair

Thus, they are able to trigger two i.i.d. channel responses to be exploited by the RFID reader.

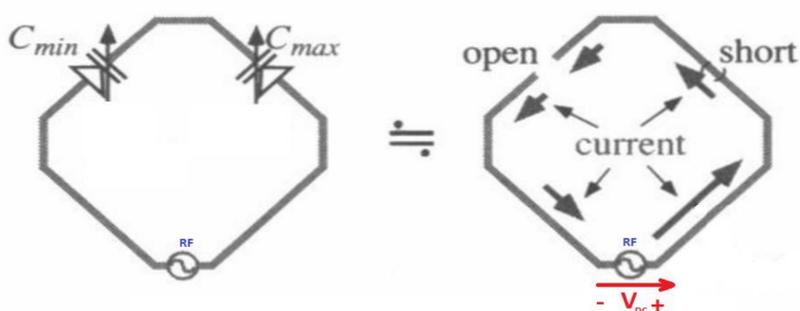
Proposed System



Conclusion

By equipping the RFID tag with a simple switched loop antenna, the direction of the tag can be estimated using a single receive antenna at the reader's side. This in turn helps future integration of RFID readers in consumer handheld terminals like future smartphones.

Proposed System, ctd'



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