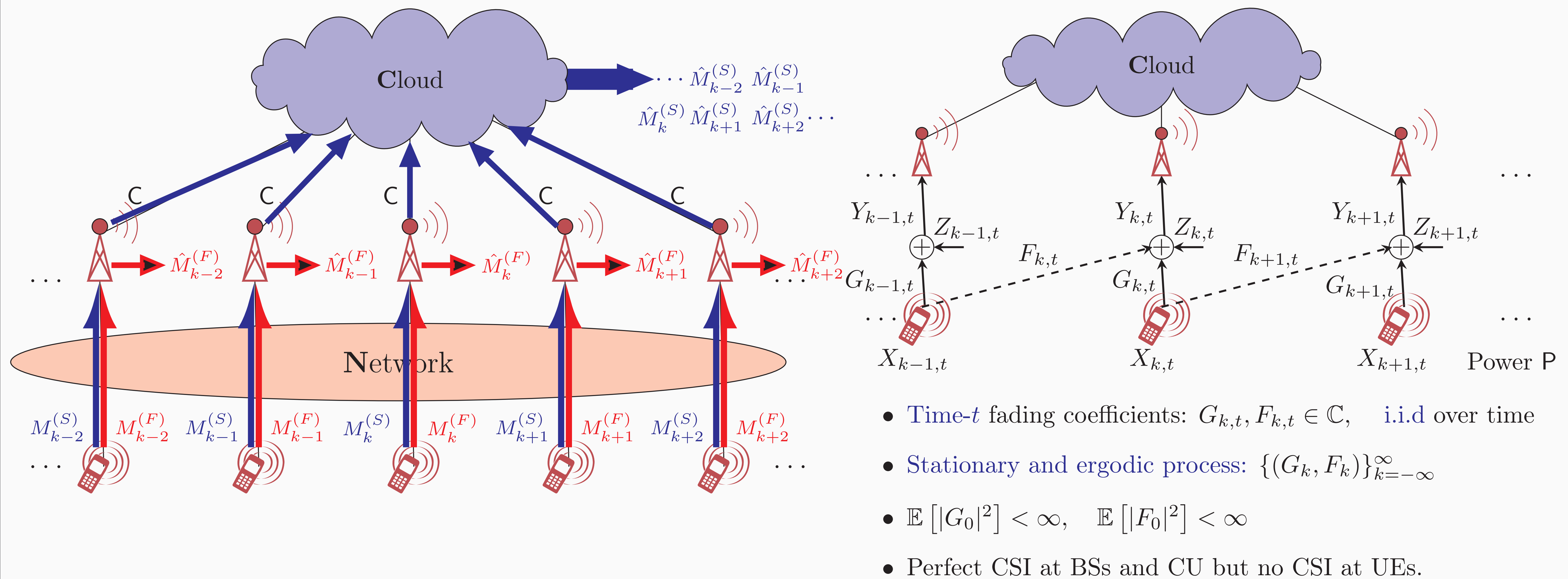




## Introduction

A cloud radio access network (C-RAN) is considered where the first hop from the user equipments (UEs) to the basestations (BSs) is modeled by the fading Wyner soft-handoff model. The focus is on mixed-delay constraints where a set of messages (so called "slow" messages) are jointly decoded in the cloud unit (CU), whereas the remaining messages (called "fast" messages) have to be decoded immediately at the BSs.

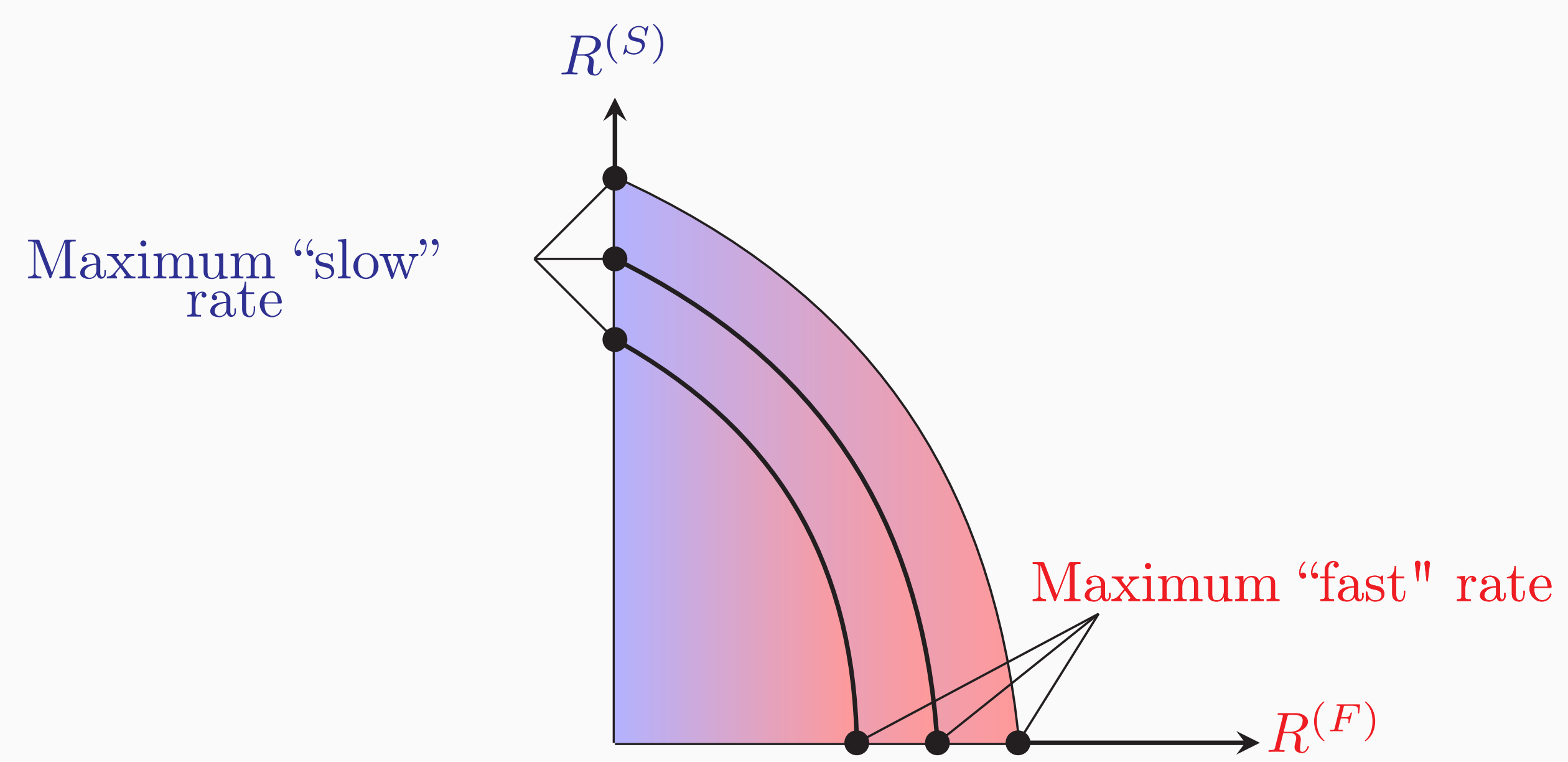
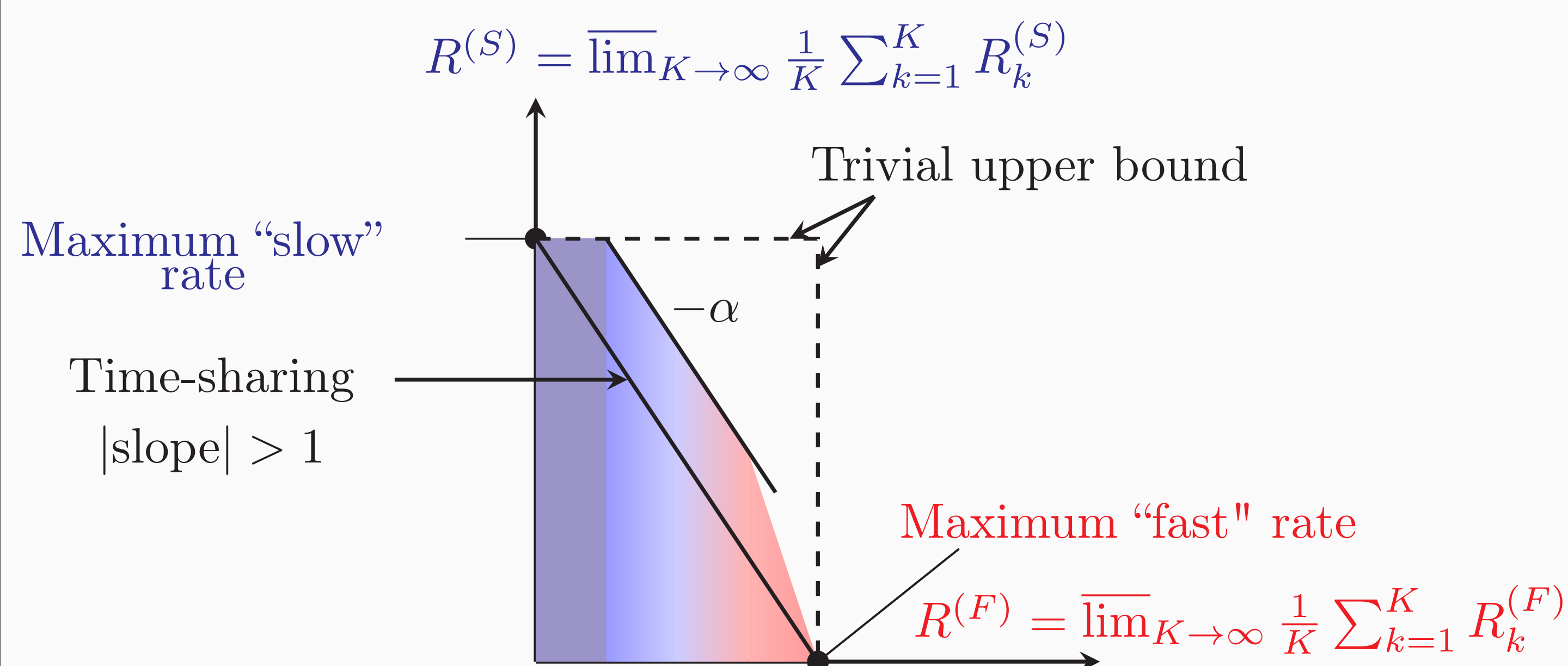
## Problem Setup



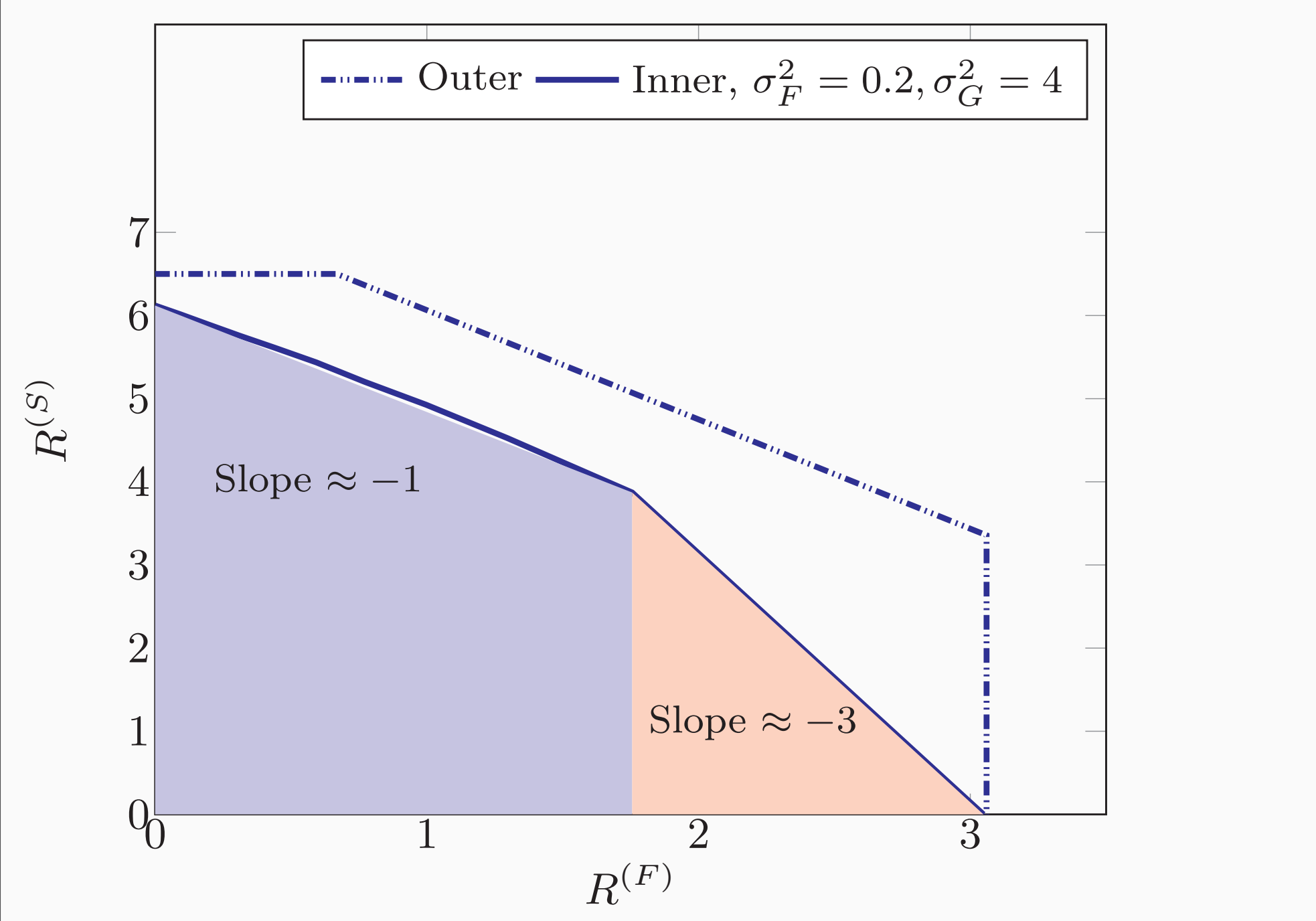
## Main Interests

Q1: Cost of "fast" messages rate on sum-rate?

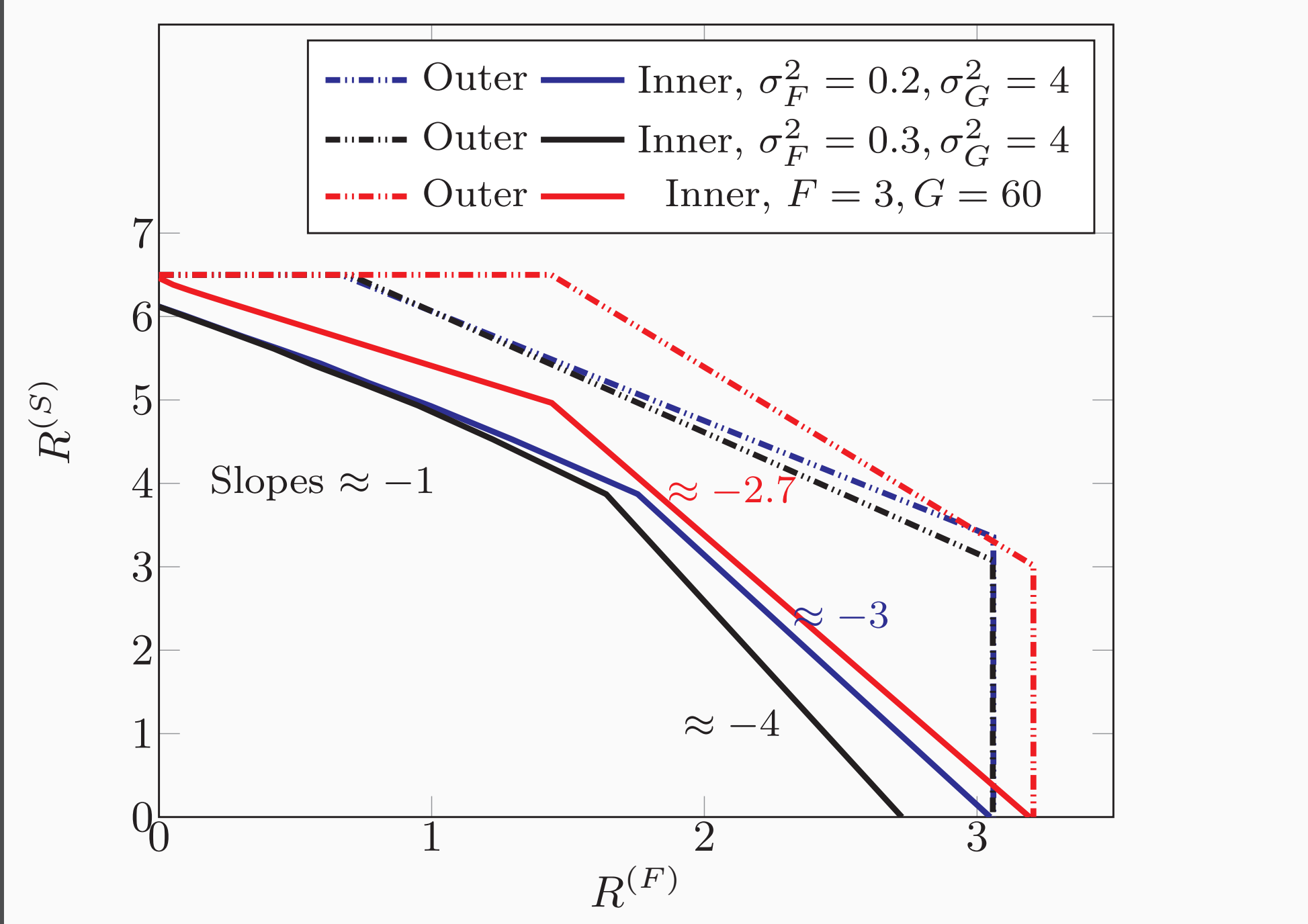
Q2: Random time-varying vs static coefficients?



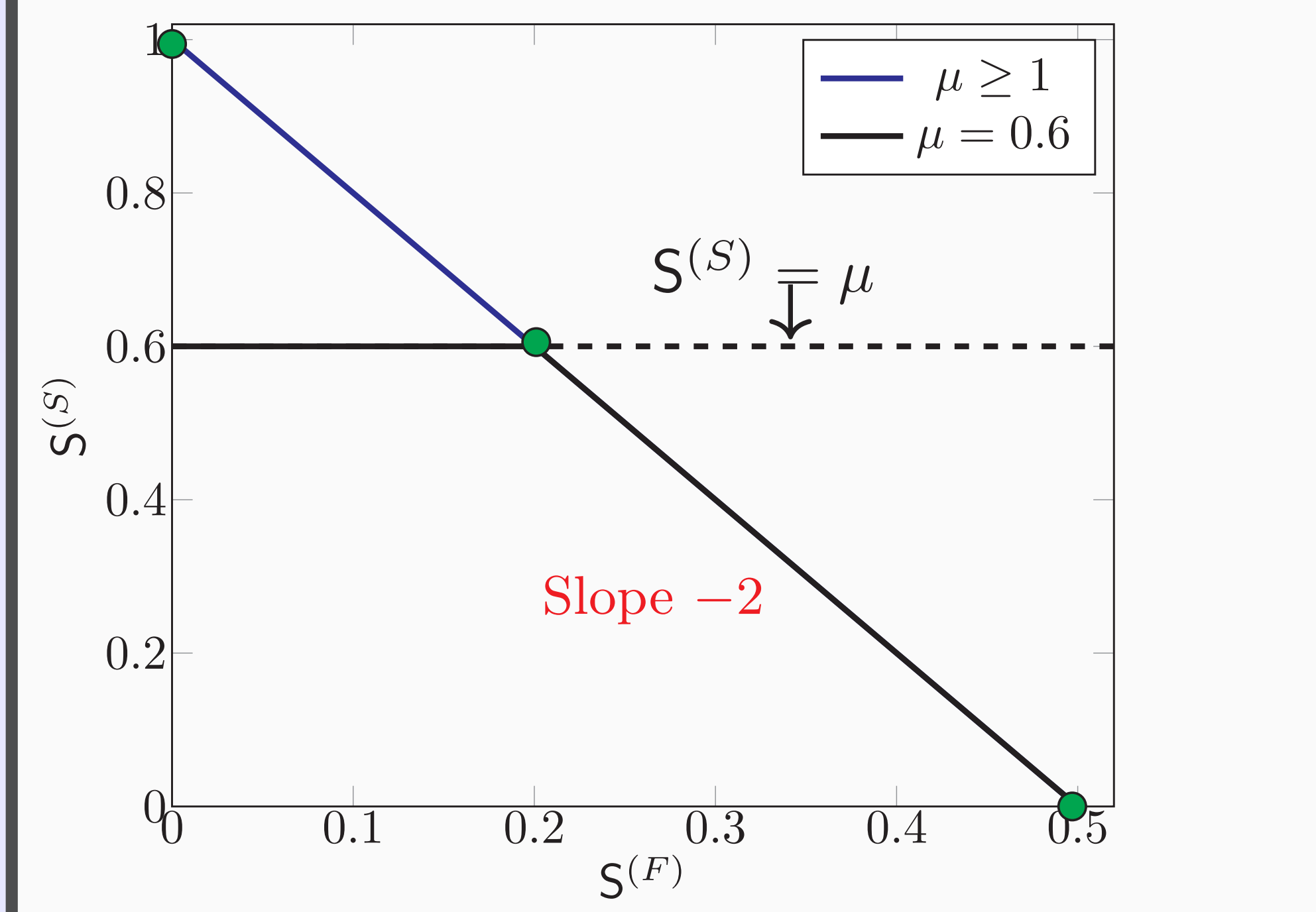
## Results: A1



## Results: A2



## Results: High SNR



## Conclusions

- At high SNR:
  - Small values of fronthaul capacity and small "fast" MG: Decoding "fast" messages directly at BS  $\rightarrow$  improves the sum-MG.
- At finite SNR:
  - No penalty in sum-rate, for moderate "fast" messages rate.
  - Higher price for random channel coefficients.

## References

H. Nikbakht, M. Wigger, W. Hachem and S. Shamai (Shitz), "Mixed delay constraints on a fading C-RAN uplink," in *Proc. IEEE ITW 2019*, Visby, Sweden, Aug 25–28, 2019.