

Efficient Resource Allocation for Power Minimization in MIMO-OFDM Downlink

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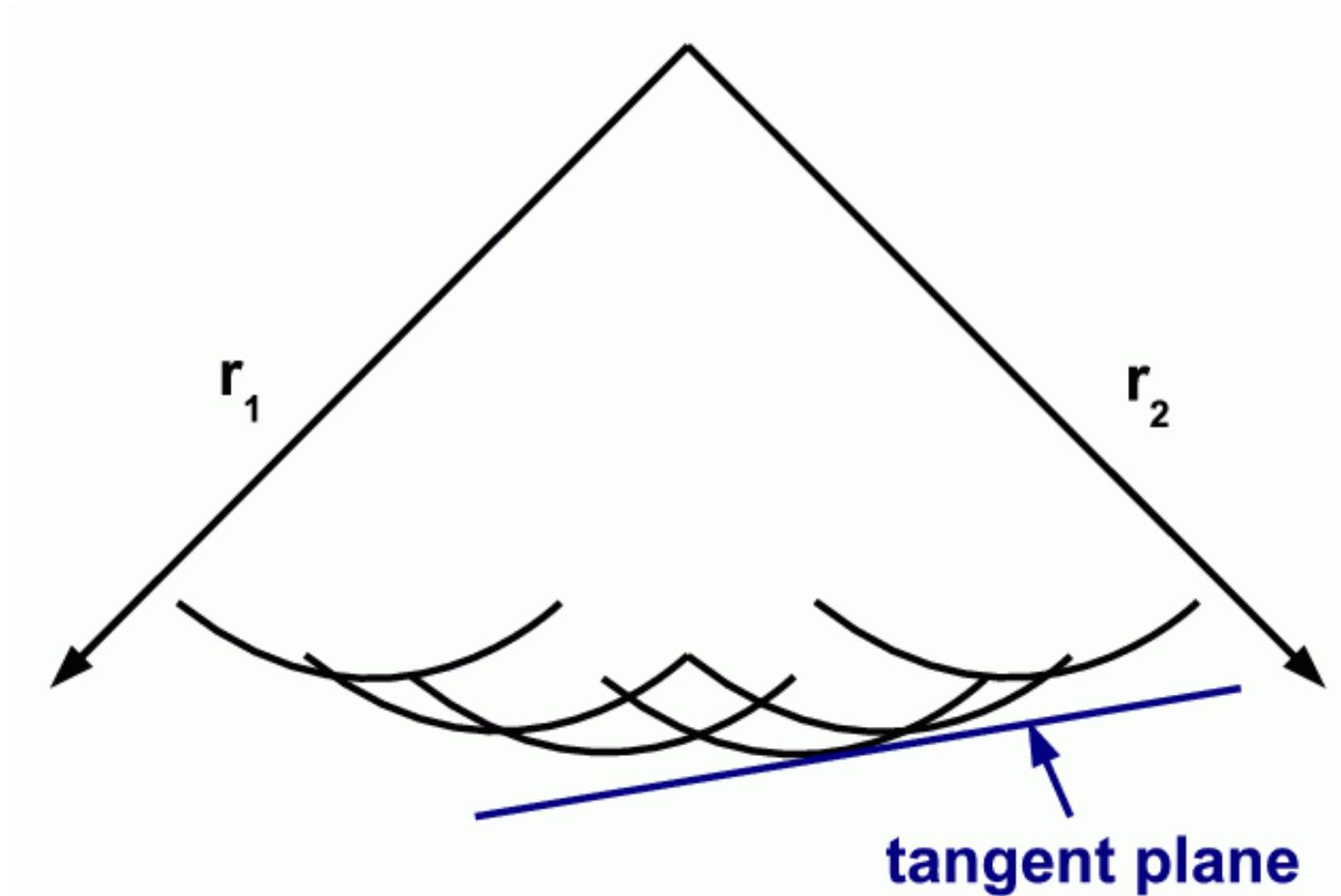
VTC 2008 Fall, Calgary



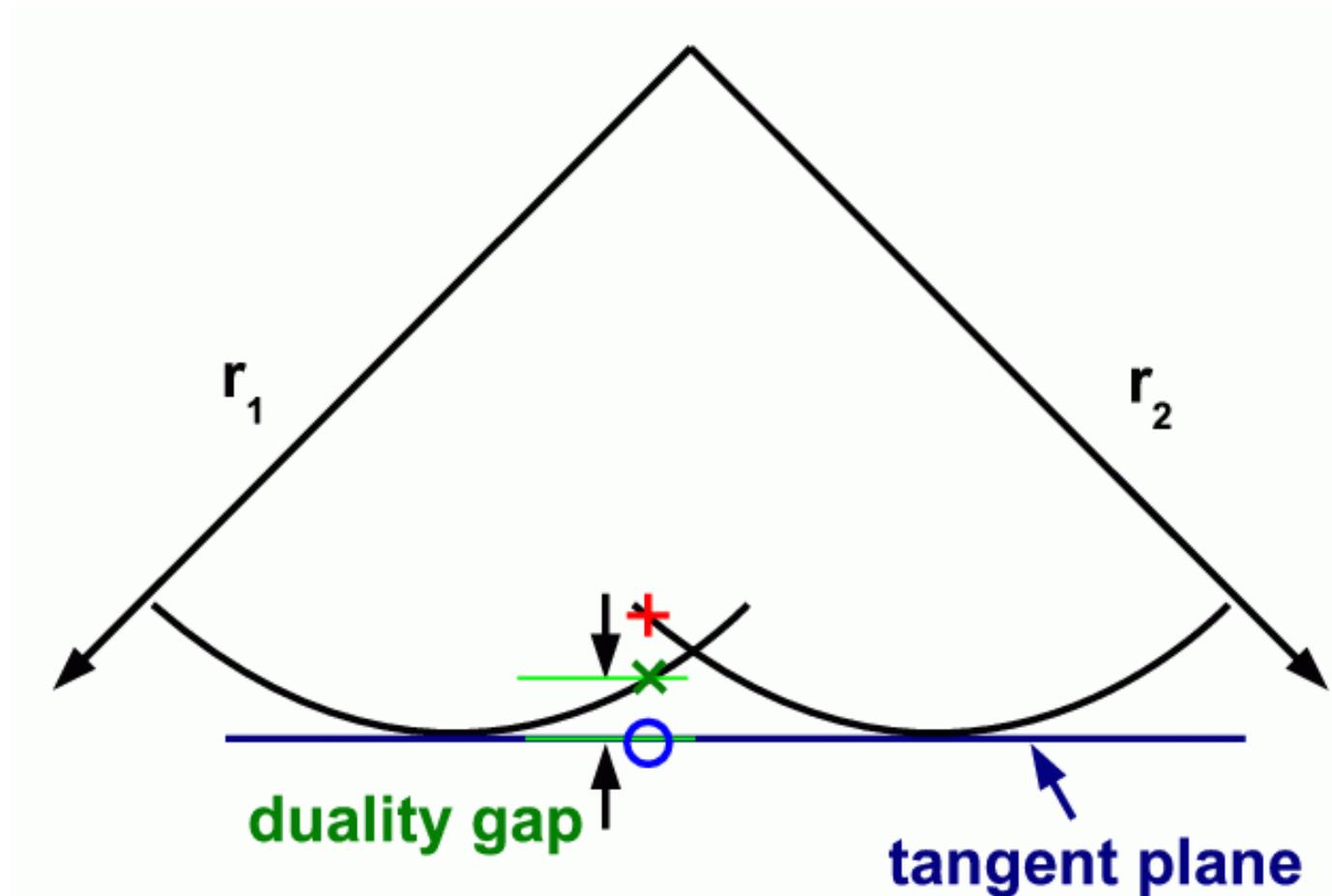
Introduction

- ✚ Power minimization – rate requirements
- ✚ Optimal – High complexity $\mathcal{O}(K^M)$
- ✚ Lagrange dual decomposition
- ✚ Propose Efficient $\mathcal{O}(KM)$
- ✚ Dual Proportional Fairness
- ✚ Duality gap

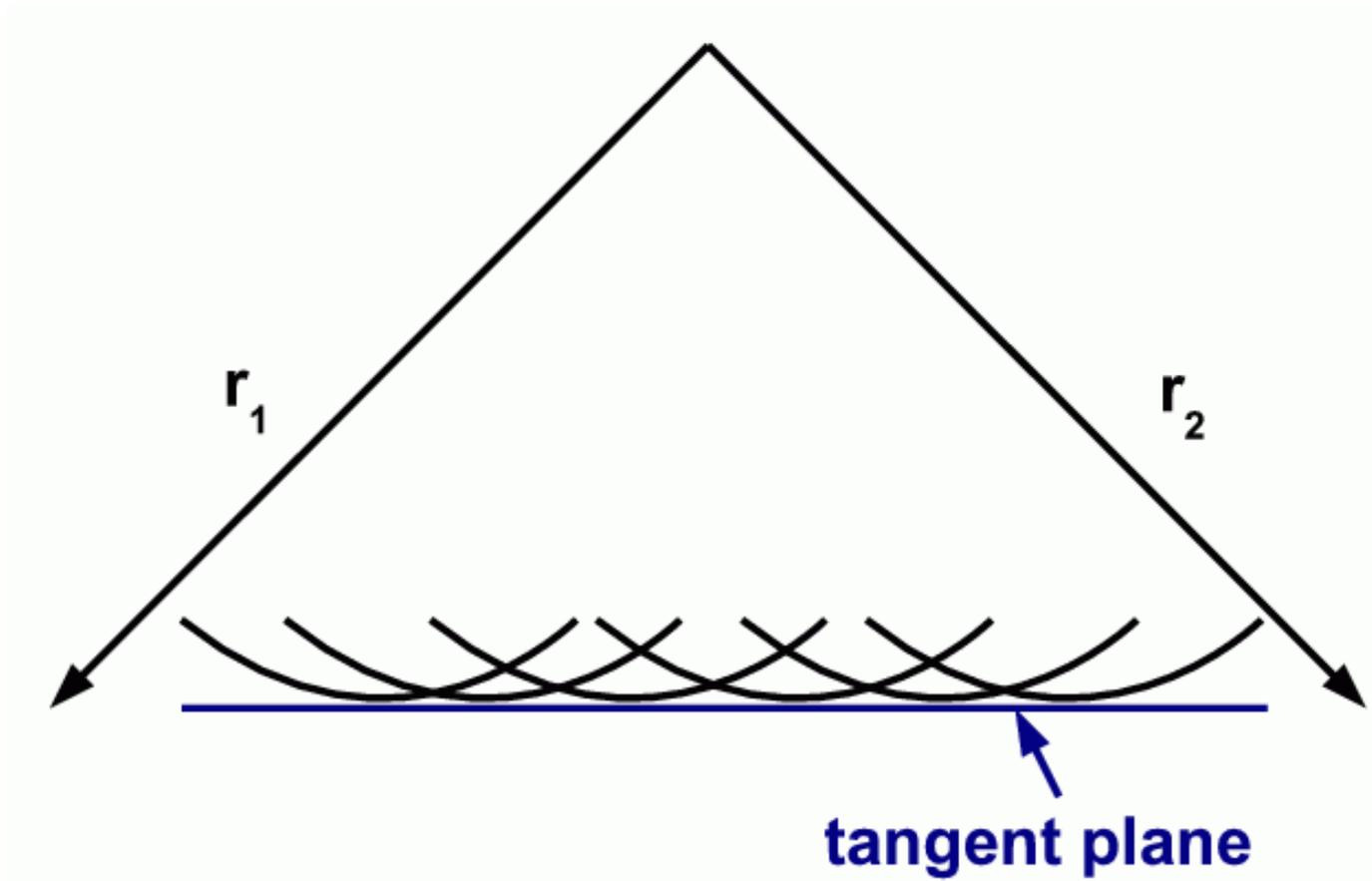
Power surfaces and tangent plane



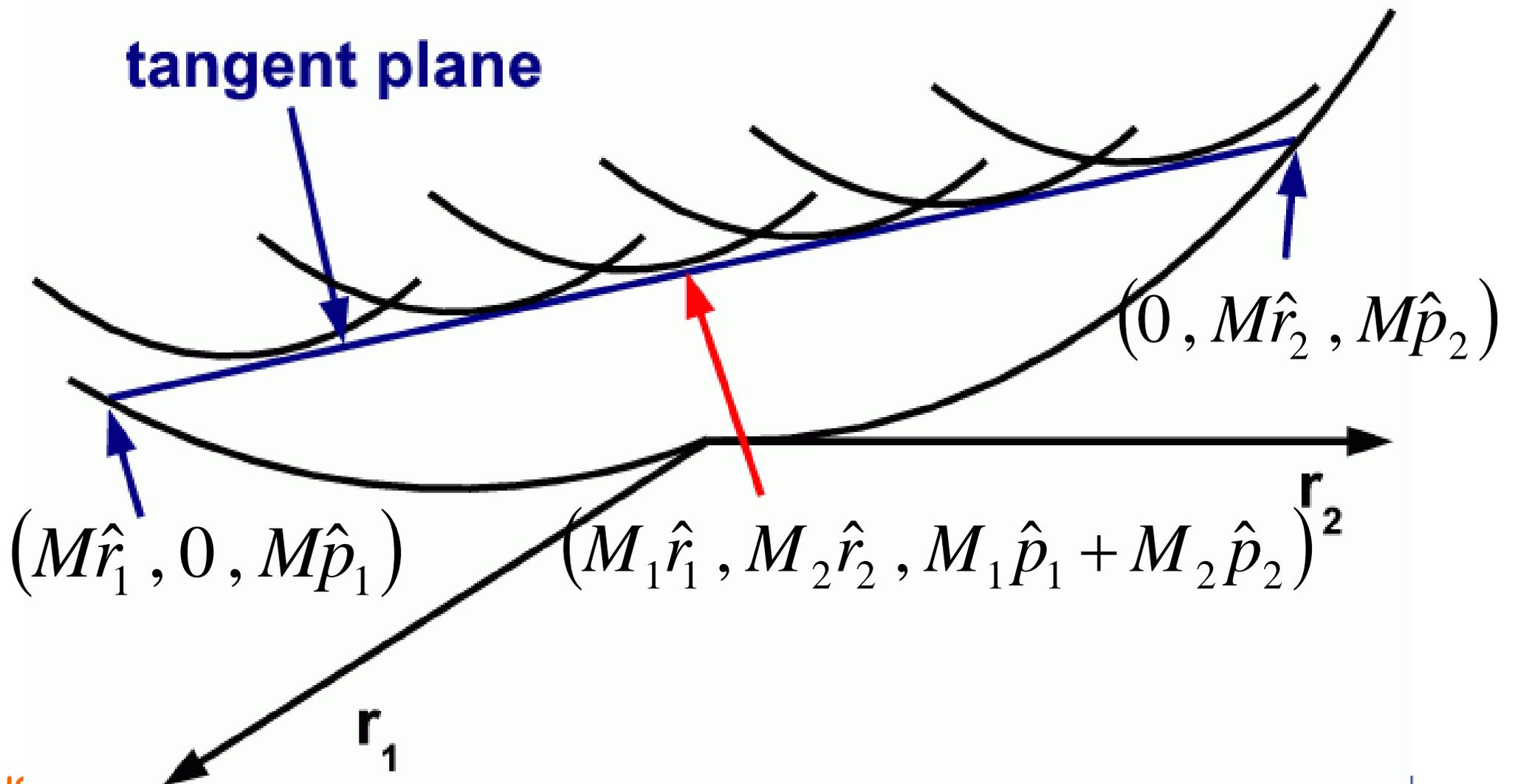
Duality gap



Flat fading



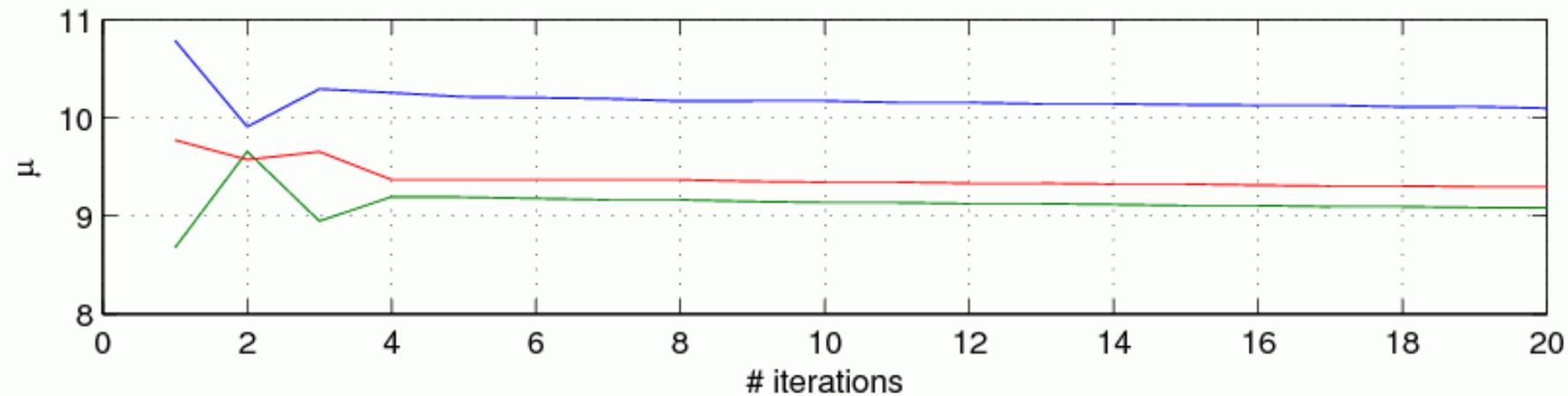
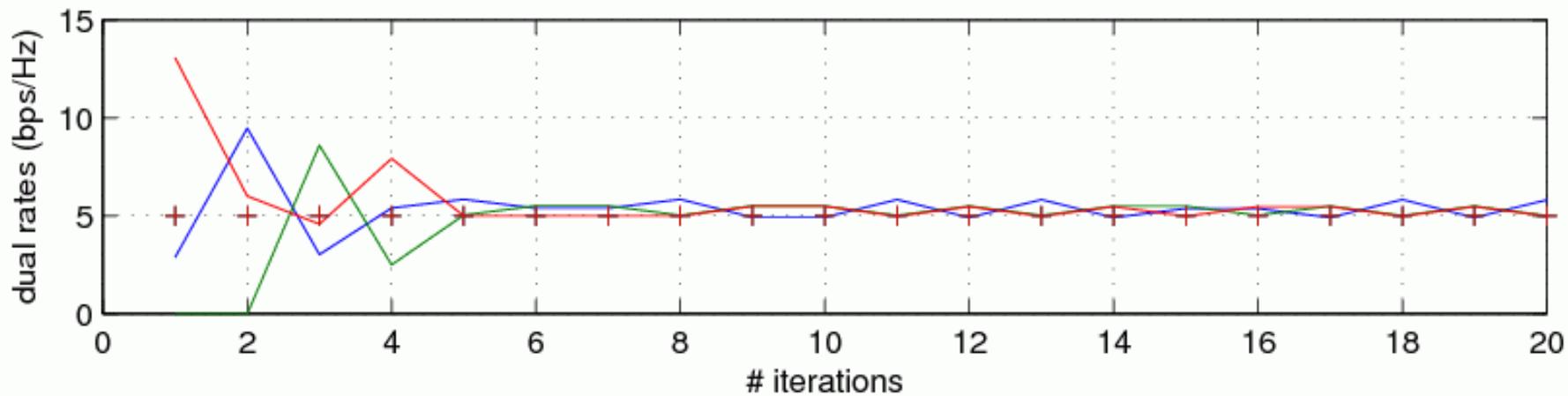
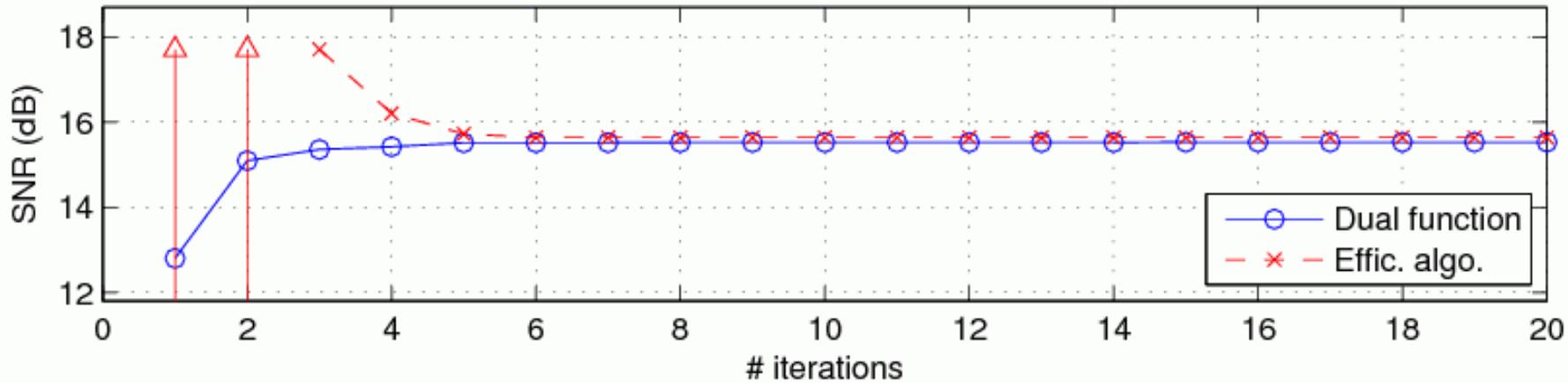
Dual Proportional Fairness



Algo to manage flat fading

1. Identify the flat fading users.
2. Identify the flat fading groups.
3. Distribute the subcarriers proportionally for each fading group.

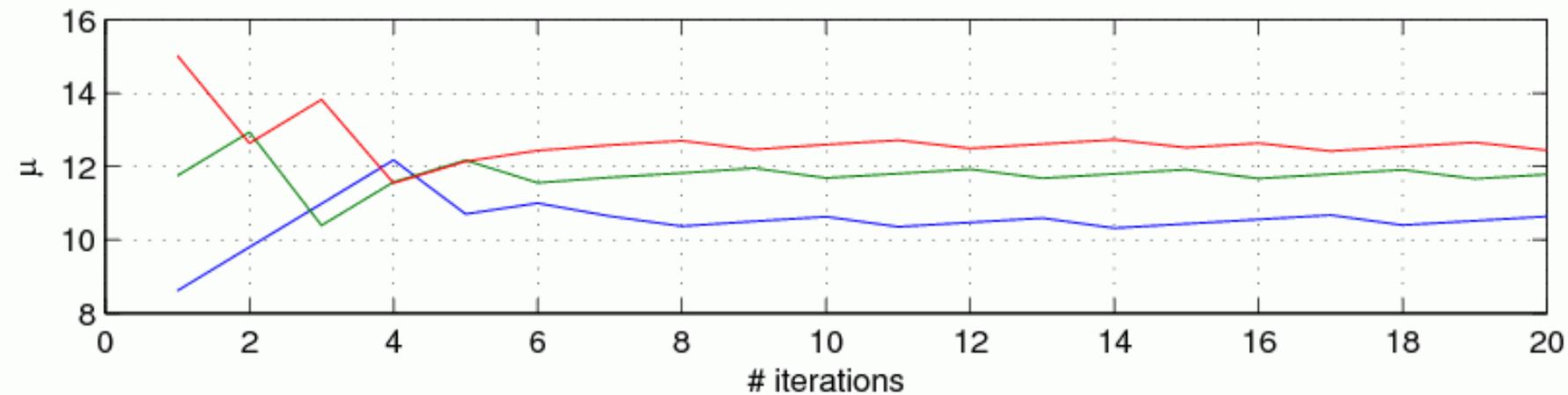
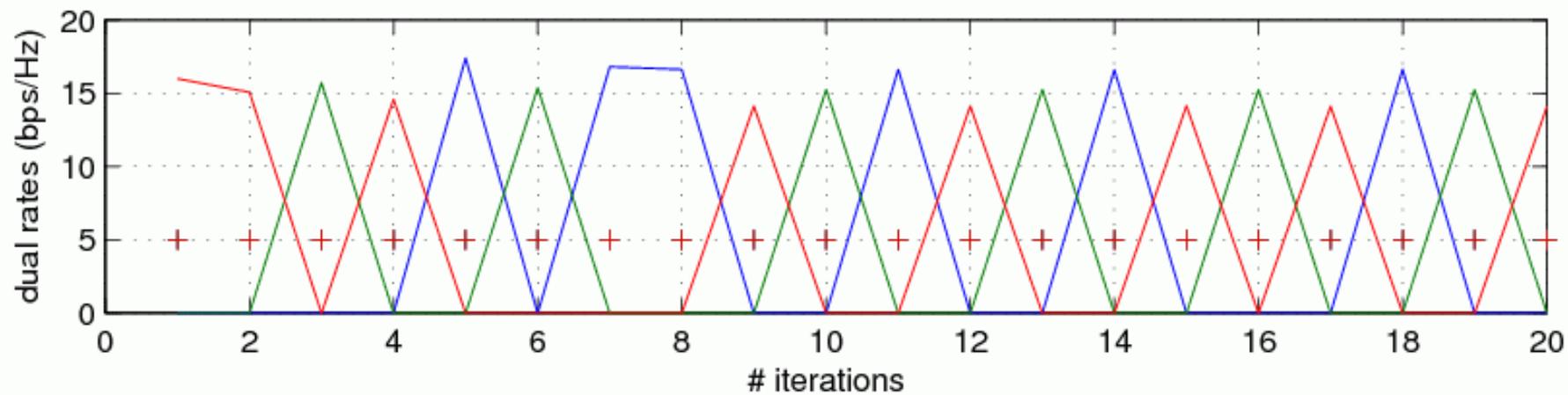
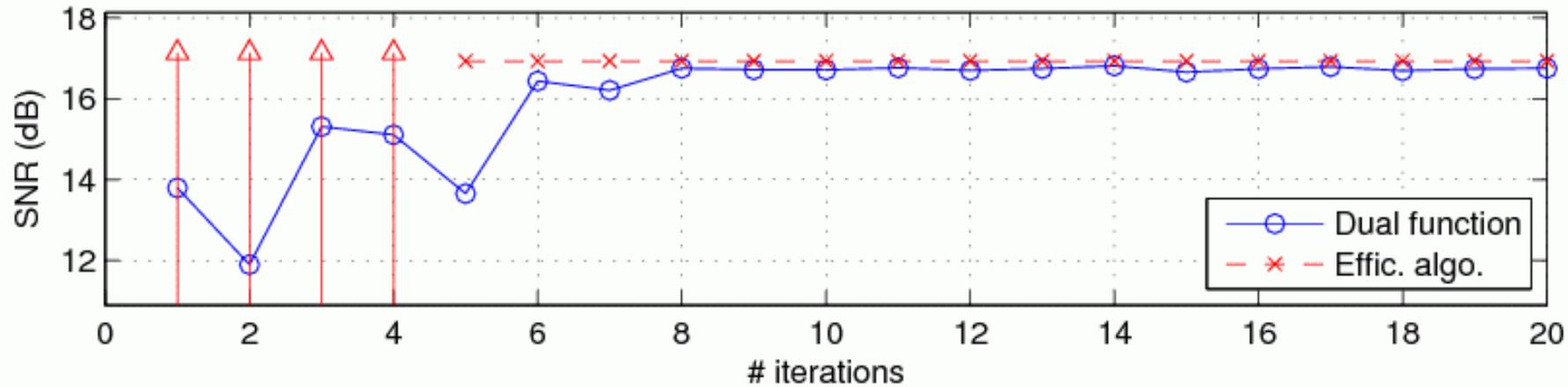
Simulation Results (1)



32 sub
carrier
3 user
4x[4,4
,4]
5 bps
/Hz
f-selec
fading



Simulation Results (2)



32 sub
carrier
3 user
4x[4,4
,4]
5 bps
/Hz
flat
fading



Conclusion

- ✚ MIMO-OFDM downlink
- ✚ Power minimization
- ✚ Rate requirements
- ✚ Dual decomposition
- ✚ $O(K^M)$ to $O(KM)$
- ✚ Dual proportional fairness
- ✚ Near optimal performance