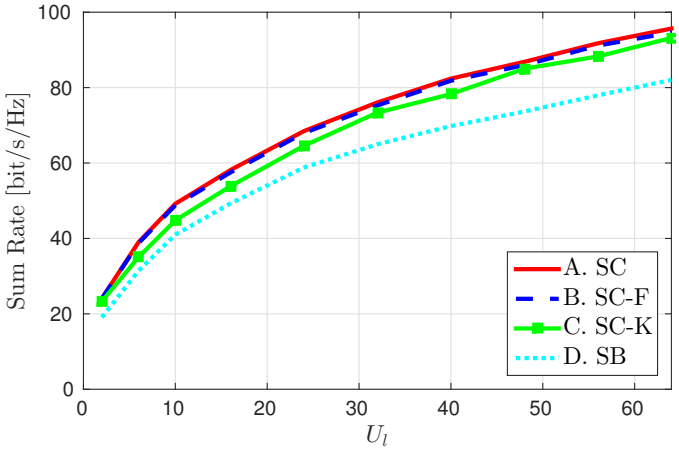

Fig. 5: Average sum rate for SNR 25 dB and $M_l = 8$

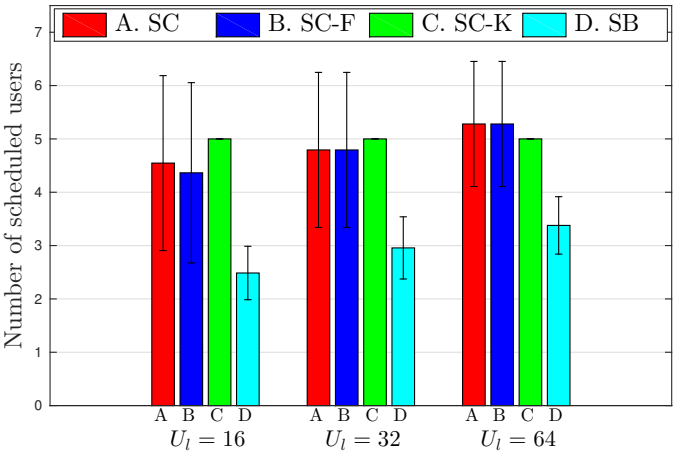

Fig. 6: Average number of scheduled users for SNR 25 dB and $M_l = 8$

VI. Conclusions

In this paper, we considered a system with hierarchical beamforming which is designed partly at the cloud and partly at the BS. This beamforming split allows coordination while requiring only small amount of signaling over the fronthaul links because only statistical CSI is transmitted to the cloud. To generalize and enhance the preprocessing, we study the user scheduling and propose four different scheduling strategies which do not require additional signaling. All algorithms have inner beamformers designed at the BS which adapts to the instantaneous channel changes within the transmission subspace predefined at the cloud. Three of the strategies (SC, SC-F and SC-K) perform coordinated scheduling/ coordinated outer beamforming at the cloud and the fourth one (SB) has coordinated outer beamforming at the cloud but assigns the served users at the BSs. Simulation results show that letting the cloud schedule the users is more beneficial, even though it has only slow varying statistical channel knowledge. The scheduling at the cloud achieves impressive system sum rate while not demanding long executing time.

Acknowledgment

This work has been performed in the context of DFG funded CRC 1053 MAKI.

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