

**Session Title:** User Selection Scheme for Amplify-and-Forward Relaying with Zero Forcing

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**Abstract:** In this paper, we report the results of an investigation and analysis of the performance of amplify and forward (AF) gateways employing zero forcing (ZF) beamforming techniques in a space division multiple access scenario. A random number of users are isolated from their destination(s) and can communicate with them only through an AF gateway equipped with multiple antennas and employing a ZF beamforming technique. The channels experience both small and large-scale fading. For large numbers of users, we introduce User Selection and Group Selection schemes, to keep the number of users less than or equal to the number of relay antennas in each group, with the goal of improving system performance. New, exact analytical expressions are derived for the overall spectral efficiency. The new results are used to investigate the impact of different system parameters on the overall efficiency of ZF gateways. The accuracy of the new results is confirmed through comparison with Monte Carlo simulations.