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## Virtualization of Spatial Streams for Enhanced Spectrum Sharing

Abstract—In this work we propose a virtualized network architecture for an infrastructure provider that shares the physical resources of a Massive MIMO cell among several virtual network operators (VNOs) using spatial multi-plexing. In this architecture the infrastructure provider allocates spatial streams to the VNOs, which enables each VNO to select its own scheduling policy and user priority to differentiate its service from the other VNOs. To assign the spatial streams to the VNOs that value them the most, we propose an auction-based spatial stream allocation approach. We show that the proposed auction-based approach performs very close to the optimal (fixed) approach in the case of homogeneous static VNOs demand. In case of heterogeneous demands, the auction mechanism is able to dynamically allocate the resources according to the needs of different VNOs.

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