Thesen

- The multiuser interference is a major performance-limiting factor in current wireless radio communication systems, due to the scarceness of spectrum.

- IA is able to achieve the DoFs of many multiuser interference networks, leading to outstanding performances in the high-SNR regime.

- Relay-aided IA requires few resource extensions and few antennas at the source and destination nodes; many relay-aided IA problems have closed-form solutions.

- To achieve relay-aided IA, the transmit filters, the receive filters, and the relay processing filters shall be cooperatively designed to satisfy all the IN conditions while not violating any of the validity conditions.

- The existence of such an IA solution requires that the invalid IN solutions form either linear hyperplanes or negligibly small non-linear subsets of the IN solution space.

- Given any valid IN solution, the achievable sum rate can be maximized under a total sum transmit power constraint or under individual sum power constraints.

- In the cellular networks, relay-aided IA includes inter-cell IN and intra-cell interference management exploiting beamforming techniques such as ZF and MMSE.

- The uplink-downlink duality of relay-aided IA implies that both the inter-cell IN solutions and the beamforming matrices designed for intra-cell interference management in the uplink and the downlink are dual.

- In the partially connected ad-hoc networks, relay-aided IA can be achieved with partial channel knowledge, which includes the intra-subnetwork CSI, the network topology, and the side information.