

## ABSTRACT

Techniques for end-to-end beamforming in a wireless communication system using access node clusters that are distinct from a user coverage area are described. Forward link end-to-end beamforming may involve multiple access nodes in one or more access node clusters transmitting signals that, when relayed by multiple transmit/receive signals paths within an end-to-end-relay, form user beams in the user coverage area. Return link end-to-end beamforming includes applying beamforming weights to signals transmitted by user terminals and relayed by multiple transmit/receive signals paths in the end-to-end relay to the access nodes to form return beam signals associated with return user beams. The access node clusters may overlap or be outside the user coverage area, and multiple access node clusters may serve one or more user coverage areas selectively or concurrently. Multiple feeder-link frequency bands may be employed by the same or different access node clusters.

[Figure 5]