Mitigating Performance Degradation in LTE Advance using Relaying Node

Abstract

Long Term Evolution-Advanced (LTE-Advanced) is the 3rd Generation Partnership Project (3GPP) candidate technology which is expected to enhance cell edge capacity, system throughput as well as reduce the user and control plane latencies. Generally in the wireless networks, the cell edge users are experiencing a low signal-to-noise-interference ratio (SINR), causes the low user throughput which leads to overall bad system performance. Similarly, it also causes the small cell coverage and capacity at the cell edge. Moreover, the 3GPP LTE-Advanced is required to provide peak data rates in order to support the high data services and applications. In order to solve this problem, the relaying technique has been proposed. Relays are expected to improve the system capacity and coverage as the low SINR users will hand over to the relay node and utilize the system resources efficiently. To meet these requirements, different LTE-Advanced technologies have been studied in which includes relay
node (RN) deployments. According to resource utilization on backhaul link (eNB-RN), relay nodes have been differentiated into different types. Inband RNs utilizes the same frequency spectrum for both the, backhaul link (eNB-RN) and access link (RN-UE). Both of these links time-divisioned multiplexed as both are operating on single frequency. This approach may create some limitations on the resource utilization at backhaul link of inband RNs which can be reduced by introducing enough physical isolation between the antennas structure of two links. This paper discusses relay node (RN) deployment on LTE-Advanced networks. Relay nodes are believed to give high data rates coverage with minimum operator cost. It also enhances the network capacity by increasing the overall cell throughput, due to efficient utilization of network resources.

References

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Index Terms

Computer Science
Networks

Keywords
LTE-Advanced  3GPP  Relay deployment  backhaul  amplify and forward relaying