Bachelor assignment

Project: **Applicability of relay-enabled scheduling in LTE networks**

Duration*:* 4 months

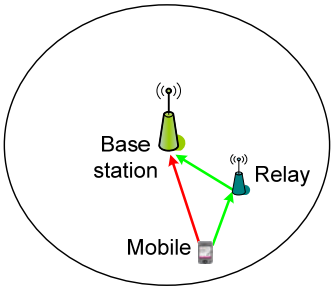

Figure 1 Application of a relay within a cell

A common problem of cellular networks is signal degradation with the increase of distance. A consequence of signal degradation is the poor service level provided to mobile users at the edge of the cell. While other shortcomings of the cellular technologies could be avoided by introducing more advanced processing, signal degradation, as a result of wave propagation, is not that easily avoided.

Relaying is a deployment strategy which makes use of an additional repeater on the path between base station and mobile user. The effect is of shortening the distance between two communicating units and thus diminishing the negative effect of signal degradation. We can expect then that using a relay could improve the service, i.e. data rates, offered to mobile users at the cell edge.

The applicability of a relay has been examined already for UMTS and HSPA networks. However these are already established, well deployed technologies. It is rather more interesting to evaluate the possibilities to use a relay in a LTE network and whether users can benefit from it.

The goal of the assignment is to determine how a relay can be introduced into a LTE network and evaluate its effects on system performance. To achieve the goal the student needs to understand the basics of the LTE technology and the scheduling in particular. The steps included in this research are:

- Get familiar with LTE and the existing proposals for schedulers.
- Adopt existing or propose new scheduling schemes which incorporate the use of a relay.
- Define evaluation scenarios and examine the performance of the schemes.

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