

Las Vegas, USA

February 27th – March 2nd, 2001

Agenda item: 15 (Rel 5: Radio link performance enhancements)
Source: NEC
Title: Closed Loop Mode Transmit Diversity for DSCH in Soft Handover
Document for: Discussion

1. Introduction

DSCH transmit diversity operation in soft handover was discussed, and solutions were proposed in TSG RAN WG1 #16 meeting [1]. This contribution presents another alternative to improve the performance of closed-loop mode transmit diversity.

2. Background

When UE is in SHO mode, PDSCH is transmitted from only one cell, and the associated DPCH is transmitted from all cells in the active set. When closed-loop mode transmit diversity is applied in soft handover mode, the feedback information is determined based on the signals from all cells in the active set.

In order to improve the performance of PDSCH with closed-loop mode transmit diversity, “modified FBI field” was proposed to transmit FBI bits for PDSCH and DPCH respectively. Also, “extended SSdT” and “TxAA/STTD” were proposed in [1]. It was noted that the increase of feedback delay might lead to performance degradation for high-velocity UE, and “extended SSdT” and “TxAA/STTD” might be used if the velocity of UE is correctly estimated.

3. A possible solution

Another solution is outlined in Table 1, and is described as follows:

- During transmission of PDSCH, FBI is determined by the signals from the cell that transmits the PDSCH. For the transmission of PDSCH and DPCH in the cell, the FBI is used. In other cells, the FBI is ignored.
- When only DPCH is received, FBI is determined by the signals from all cells in the active set, and the FBI is used for DPCH in the all cells.

Table 1: Possible operation in soft handover mode

Transmission	Determination of FBI	PDSCH	DPCH in the PDSCH cell	DPCH in the non-PDSCH cell
PDSCH+DPCH	PDSCH cell	FBI is used.	FBI is used.	FBI is ignored.
Only DPCH	All cells	(Not used)	FBI is used.	

With the above solution, the following performance is expected:

- During transmission of PDSCH and DPCH, overall performance would be maximized with the optimisation of PDSCH because transmit power of PDSCH is much larger than DPCH.
- During transmission of only DPCH, performance of DPCH would be improved by applying closed-loop mode transmit diversity.
- The switching of the FBI determination modes would bring significant improvement in a scenario where PDSCH is transmitted for only one UE and the associated DPCH is transmitted for a lot of UE.

4. Conclusion

It is proposed that the solution presented in Section 3 will be investigated as well as the methods that have been proposed so far.

References

- [1] TSGR1#16(00)1270, "DSCH Tx Diversity Operation in SHO Region", Samsung.