

R1-051513



3GPP TSG-RAN1 Meeting #43
Seoul, Korea, 7-11, November, 2005

Agenda Item: xx.x
Source: Nortel
Title: Channel Sounding for LTE-FDD
Document for: Discussion



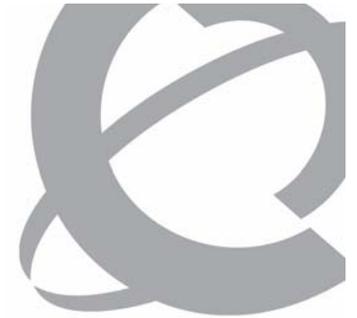
>THIS IS **THE WAY**

Channel Sounding for LTE-FDD

Nortel

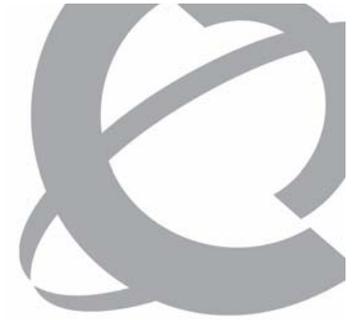
Nov. 2005

>THIS IS ~~N~~ORTEL



Introduction and Background

- > The channel-aware transmission enables several multiple-antenna transmission technologies
 - However, in general, this requires full channel information feedback to the Node-B and it is costly at the expense of large UL resource are required.
- > We propose a round trip channel sounding for both DL and UL by allowing UE to relay the received DL common pilot samples and send back to the Node-B
 - This allows Node-B to estimate the DL link channel without the need for UE to feedback complete DL channel information
 - To support close-loop MIMO / beam-forming.
- > Applicable for both TDD and FDD
 - Allow to calibrate the transmit and receive RF chain



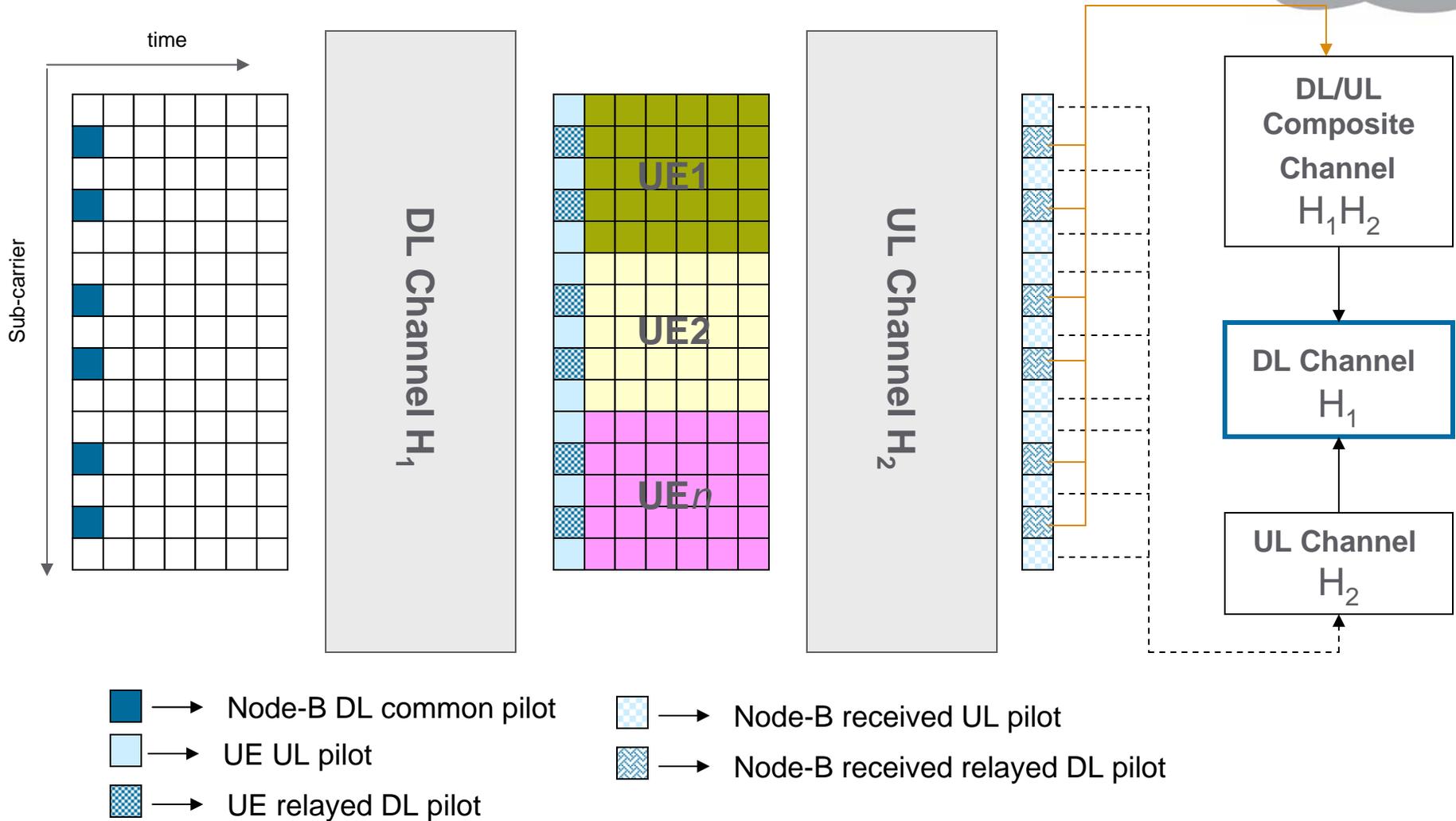
The DL Pilot, the UL Pilot and UE Relayed Pilot

- > The following set of pilots are used as the sounding pilots
 - DL common pilot
 - e.g. TDM pilot
 - UL UE specific pilot
 - For OFDMA UL the scattered pilot
 - For SC-FDMA short block pilot (distributed and localized DFT-spreading)
 - The UE relayed pilot
 - The UE inserts received DL pilot sub carrier (soft value) onto the corresponding location of UL pilot sub-carrier
- > The channel estimation can be performed on UE and Node-B to allow to estimate
 - DL channel only
 - UL channel only
 - Combined DL/UL channel → composite channel
- > This scheme avoid the need for feedback of large amount of channel matrix information

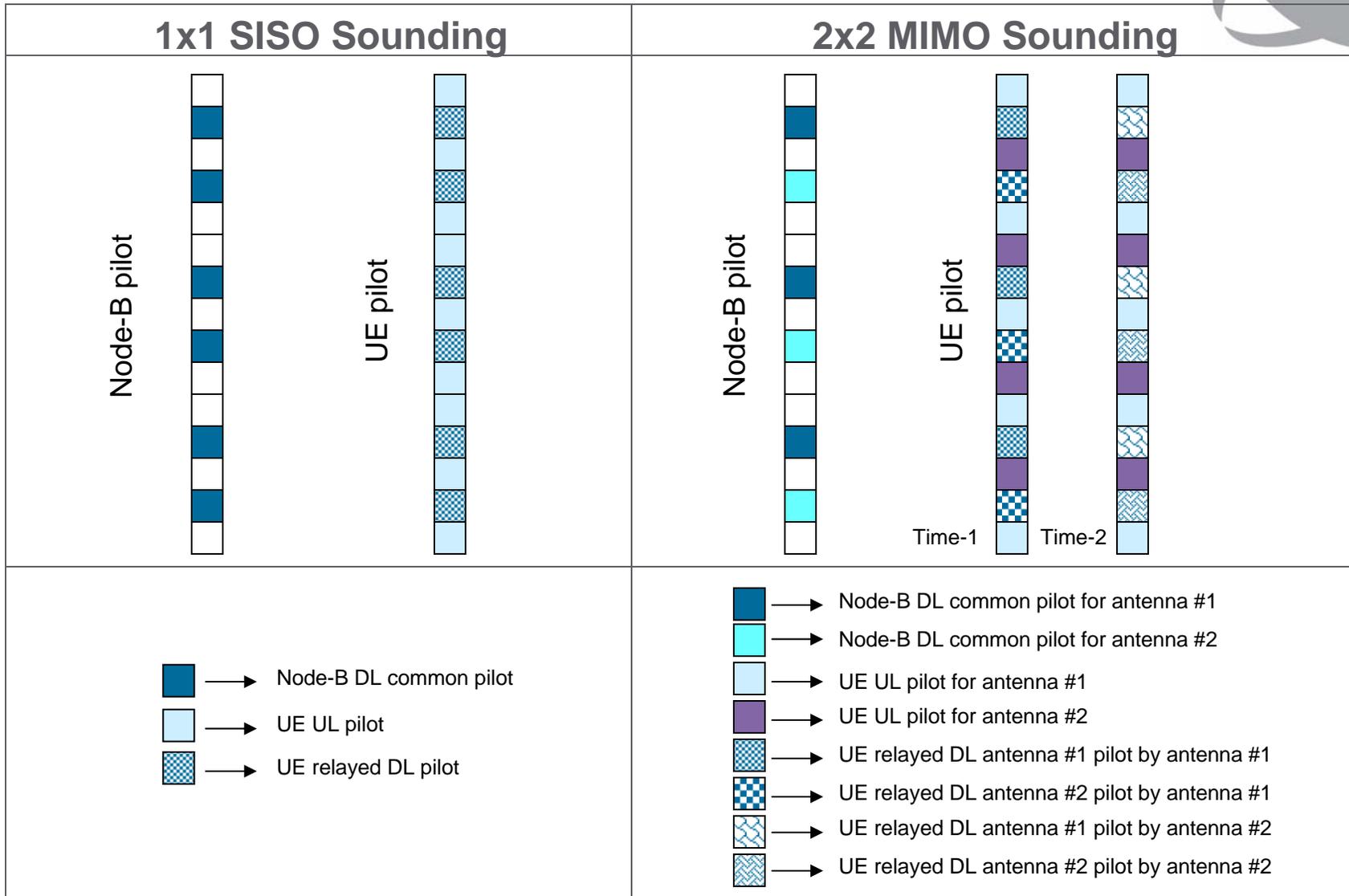
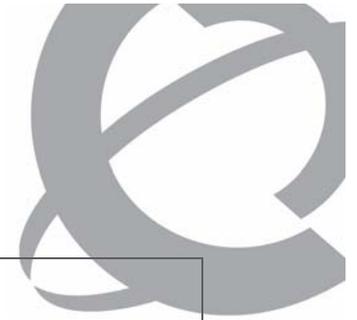
The existing DL pilot and UL pilot can be organized with UE relayed pilot to perform the around trip channel sounding

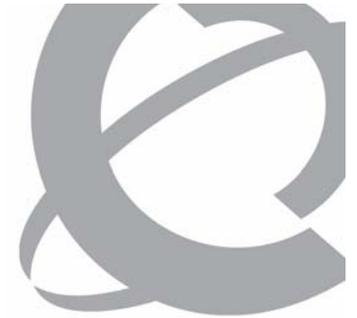
Round Trip Channel Sounding

(SISO Case)



Sounding Pilot Pattern (example)





Summary

- > We presented a UE relayed pilot scheme to enable channel aware antenna transmit such as closed loop MIMO and beam-forming for FDD
 - Without the need of UE feedback full channel information
- > Such a round-trip channel sounding can be applied for several antenna configuration cases:
 - SISO/SIMO/MISO/MIMO
- > The concept can be applied to both OFDMA and SC-based UL
 - For distributed and located DFT spreading SC-FDMA