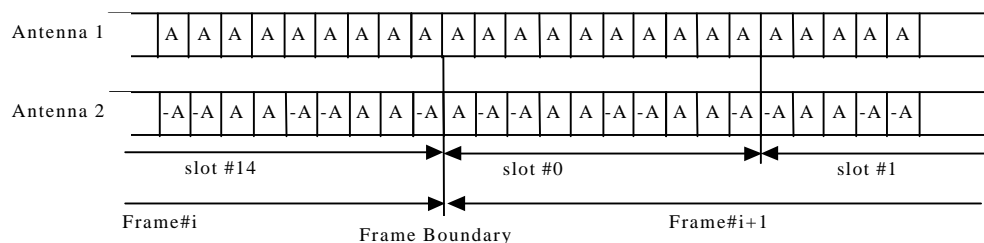


Agenda item: 6
Source: Siemens
Title: Possible Enhanced Transmit Diversity Pilot Patterns
Document for: Information

In previous meetings several proposals for closed loop TxD have been made. The method of forming channel estimates from a CPICH using more than two antennas has not been described.

A possible way of doing this is described here.

The figure below is reproduced from 25.211 v3.3.0



This shows the pattern of two antenna TxD pilot symbol transmission where $A = 1 + j$.

The pattern consists of 37 repetitions of the basic pattern

A A A A
 A -A -A A

plus one 'spare' pattern at the end of

A A
 A -A

It may be seen that the length four pattern represents the top two rows of a re-arranged Walsh matrix:

A A A A
 A -A -A A
 A A -A -A
 A -A A -A

This matrix may be used to transmit orthogonal pilots over a length which is a multiple of four. In the case of the CPICH structure this may be done for 148 of the 150 symbols in the frame. Note that the relative powers of the RF channels do not affect the basic orthogonality of the Walsh matrix. Provided an enhanced UE is aware of any deliberate power scaling correct operation can be maintained as long as each RF channel can provide sufficient E_s/N_0 .

An UE which is aware of the enhanced Walsh matrix can estimate all four channel impulse responses. A legacy UE performing 4 symbol block processing on the received channelisation code for the CPICH could, in theory, be immune to the effects of the additional pilots. There are other ways to implement CPICH with 4 antennas but many of them have other drawbacks.

As the implementation of the mobile receiver is a matter for manufacturers this form of processing cannot be assumed. This informational paper allows manufacturers a change to review and comment. We encourage comments, including on the WG1 reflector, discussing this issue.