TSG-RAN Working Group 1 meeting #18   *TSGR1(01)0098*

Boston, USA, Jan. 15 - 18, 2001

Agenda Item: AH21

Source: Siemens AG

To: TSG RAN WG1

Title: Timing Advance (T_{ADV}) Measurement in 1.28Mcps TDD

Document for: Decision

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1. Summary

Uplink synchronization is one of the main characteristics of the 1.28 Mcps TDD option. In order to keep uplink synchronization, UE should send the uplink to the Node B advanced in time. Timing Advance i.e. the difference between the RX timing and initial TX timing of a UE (T_{ADV}) is very important value for the system to estimate the propagation delay accurately. In this paper, we propose a means to measure T_{ADV} by UE in 1.28 Mcps UTRA TDD.
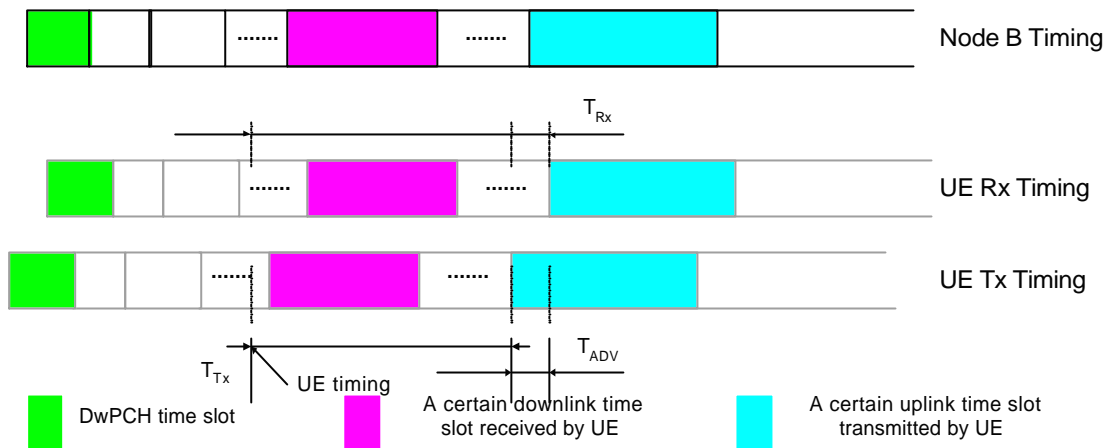
2. Introduction

Uplink synchronization is kept in 1.28Mcps TDD option by sending the uplink to the Node B advanced in time according to the timing of the received downlink. The difference between the RX timing and TX timing of a UE transmission (T_{ADV}) is the time difference

$$T_{ADV} = T_{RX} - T_{TX}$$

in multiple of 1/8 chips, where

T_{RX}: calculated beginning time of a certain uplink time slot with the UE timing according to the reception of a certain downlink time slot (for the timing it is assumed that the time slots within a sub-frame are scheduled like given in the frame structure described in 25.221 chapter 6.1)

T_{TX}: time of the beginning of the same uplink time slot by the UE (for the timing it is assumed that the time slots within a sub-frame are scheduled like given in the frame structure described in 25.221 chapter 6.1)

Node B Timing

UE Rx Timing

UE Tx Timing

■ DwPCH time slot	■ A certain downlink time slot received by UE
■ A certain uplink time slot transmitted by UE	

3. Proposal

We propose to add following paragraphs in the working CR for TS25.225 as the description and content of T_{ADV} Measurement in the 1.28Mcps TDD option.

-------------------------------------- Beginning of text proposal for working CR for 25.225 --------------------

5.2.8.2   Timing Advance (T_{ADV}) for 1.28 Mcps TDD

Definition	The 'timing advance (T_{ADV})' is the time difference
	$$T_{ADV} = T_{RX} - T_{TX}$$ in multiple of 1/8 chips, where
	T_{RX}: calculated beginning time of a certain uplink time slot with the UE timing according to the reception of a certain downlink time slot (for the timing it is assumed that the time slots within a sub-frame are scheduled like given in the frame structure described in 25.221 chapter 6.1)
	T_{TX}: time of the beginning of the same uplink time slot by the UE (for the timing it is assumed that the time slots within a sub-frame are scheduled like given in the frame structure described in 25.221 chapter 6.1)

-------------------------------------- End of text proposal for working CR for 25.225 ------------------------