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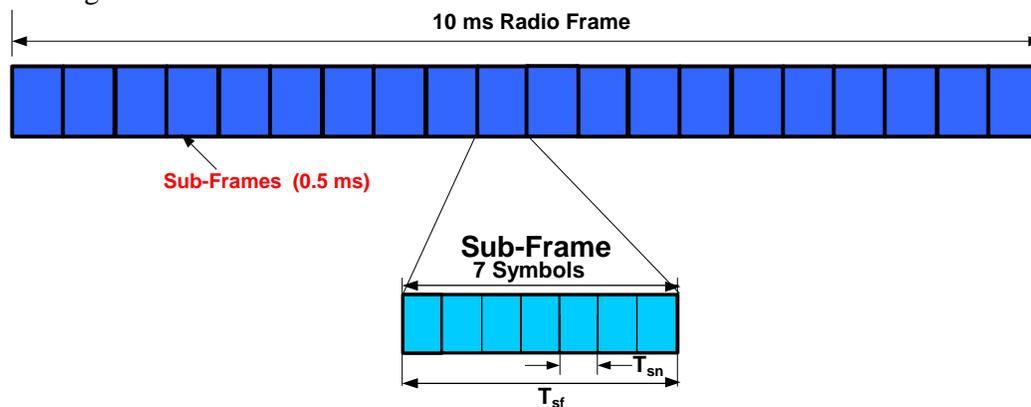
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## 1. Introduction

To efficiently utilize the unpaired spectrum across the world it is proposed to use the same base band structure for various kind of duplexing structure including FDD, TDD and Half-FDD. The radio frame and the sub-frame structures defined in [1] [2] [3] and [4] is very well suited to support TDD structure using OFDMA DL and Single Carrier based (IFDMA/DFT-SOFDM) UL. In this contribution the general concept of the TDD structure is introduced.

## 2. TDD Structure

The general radio frame and sub-frame structure of DL unicast OFDMA and single carrier UL is shown in Figure 1.



**Figure 1. Radio Frame Structure of EUTRA DL and UL.**

For the TDD structure, the total TTI duration including, DL transmit time, UL transmit time and transmit plus receive timing gap (RTG+TTG) is 5 ms or composed of ten (10) 0.5ms sub-frames in the example shown in Figure 2. The DL and UL split can be adjusted in quanta of sub-frames. As an example, the DL may comprise of 6 sub-frames (3 ms) and UL of 4 sub-frames (2 ms) resulting in a 60: 40 DL:UL split. One symbol each from the DL and UL sub-frames can be reserved to account for the TTG+RTG. It may be observed that with the framing structure proposed, it is very easy to support all the duplexing schemes like FDD, TDD and Half-FDD. It may be noted that the 5ms TTI shown here is for illustration purpose only. The TTI can be shorter or longer but going below 3 ms TTI will reduce the flexibility in adjusting the DL and UL split and make the overhead higher.

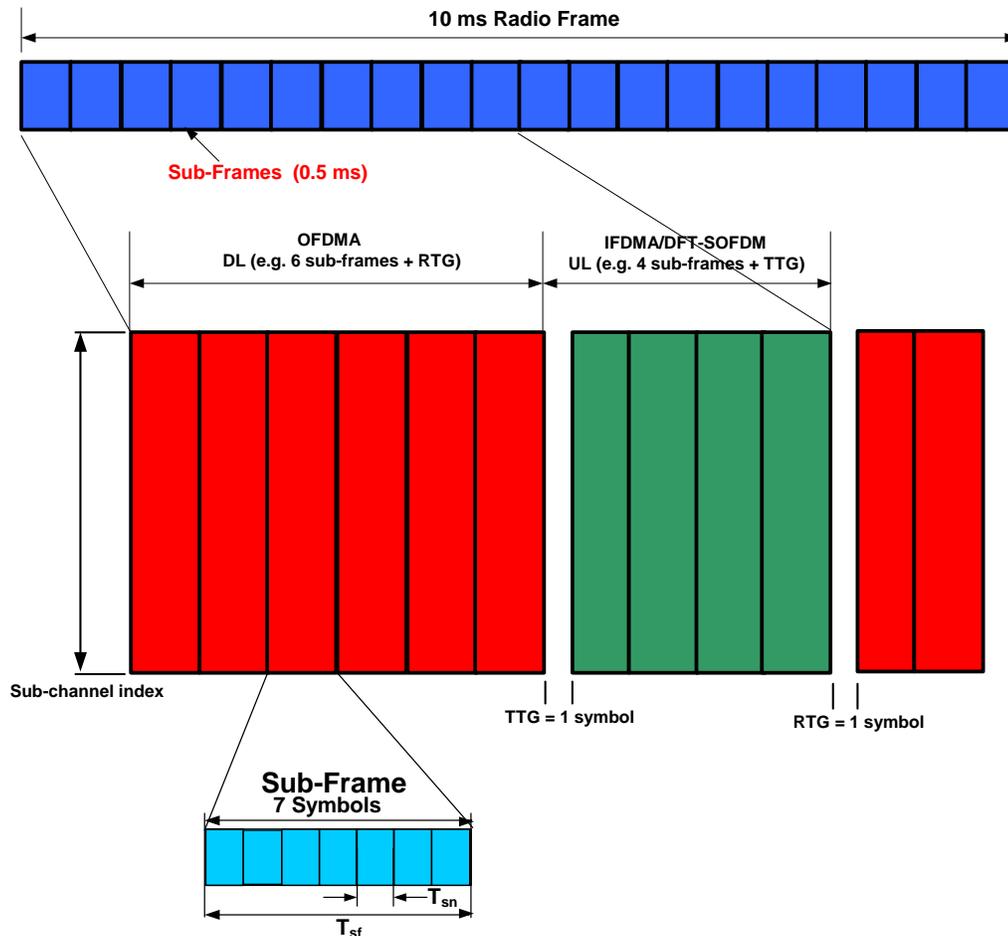


Figure 2. One TDD Frame

### 3. Conclusions

A flexible duplexing structure using OFDMA DL and IFDMA/DFT-SOFDM UL is proposed based on common baseband implementation for FDD and TDD. It is recommended to include this structure in the TR.

### 4. References

- [1] R1-050682, "3GPP TR 25.814 v 0.1.1 (2005-06)", RAN1 LTE Ad Hoc, Sophia Antipolis, France, June 2005.
- [2] 3GPP, R1-050583, Motorola, "EUTRA Downlink Numerology and Design"
- [3] 3GPP, R1-050584, Motorola, "EUTRA Uplink Numerology and Design"
- [4] 3GPP, R1-050622, Ericsson, Fujitsu, LGE, Motorola, NEC, Nokia, NTT DoCoMo, Panasonic, RITT, Samsung, Siemens, "Principles of Evolved UTRA Radio Access Concept".