



BLIND SYNCHRONIZATION IN MULTIUSER TRANSMIT-REFERENCE UWB SYSTEMS (ThuPmOR12)

★ Author(s) :

Relja Djapic

(Delft University of Technology, Netherlands)

Geert Leus

(Delft University of Technology, Netherlands)

Alle-Jan Van der Veen

(Delft University of Technology, Netherlands)

Antonio Trindade

(Delft University of Technology, Netherlands)

★ Abstract :

Ultrawideband (UWB) or impulse radio wireless communication systems are based on the transmission of extremely narrow pulses, with a duration inferior to a nanosecond. By design, Transmit-Reference (TR) UWB systems can avoid channel estimation at the receiver, while different users can share the same available bandwidth by using different spreading codes, similar to CDMA systems. This allows the receiver to separate different users, but, more crucially, to recover timing information of the transmitted packets and thus achieve synchronization within a short, burst-like packet transmission. By recognizing that a shift in time corresponds to a phase rotation in the frequency domain, a blind synchronization algorithm that takes advantage of the shift invariance structure in the frequency domain is proposed in this paper, allowing for a fast, high-resolution packet offset estimation.