Researchers at the University of South Florida have developed a new method for sub-nanosecond Ultra Wide Band (UWB) pulse shaping.

Ultra-Wideband (UWB) is a technology for transmitting information spread over a large bandwidth. UWB microwave systems are finding application in the form of impulse radio, as well as respiratory, cardiovascular and other sensing/monitoring applications. The Federal Communication Commission (FCC) defines UWB as an intentional radiator due to its wide bandwidth. This bandwidth is achieved primarily by radiating ultra short pulses. To maximize the energy within the wide band, pulse shaping is required. This shaping is achieved by differentiating or shaping the Gaussian pulse. Hence, there is a need of a method for improved simultaneous shaping of sub-nanosecond UWB waveform pulses.

Researchers at USF have developed a method for pulse shaping, referred to as the Multiport Circuit for Simultaneous Shaping of Sub-nanosecond Pulses (MCS3P), that involves the use of coupled transmission lines, which isolates the pulse generator from the pulse-shaping network. By taking advantage of structure’s isolation and blocking characteristics, and the mutual and junction capacitances, sub-nanosecond pulse shaping can be achieved. One of the advantages of this method is that it can be used for designing simple tunable pulse generators. Therefore, this method is effective in simultaneous shaping of sub-nanosecond UWB waveform pulses.

**ADVANTAGES:**

- Simultaneously shapes sub-nanosecond pulses
- Promotes the design of simple tunable pulse generators
- Isolates pulse generator from the pulse-shaping network

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