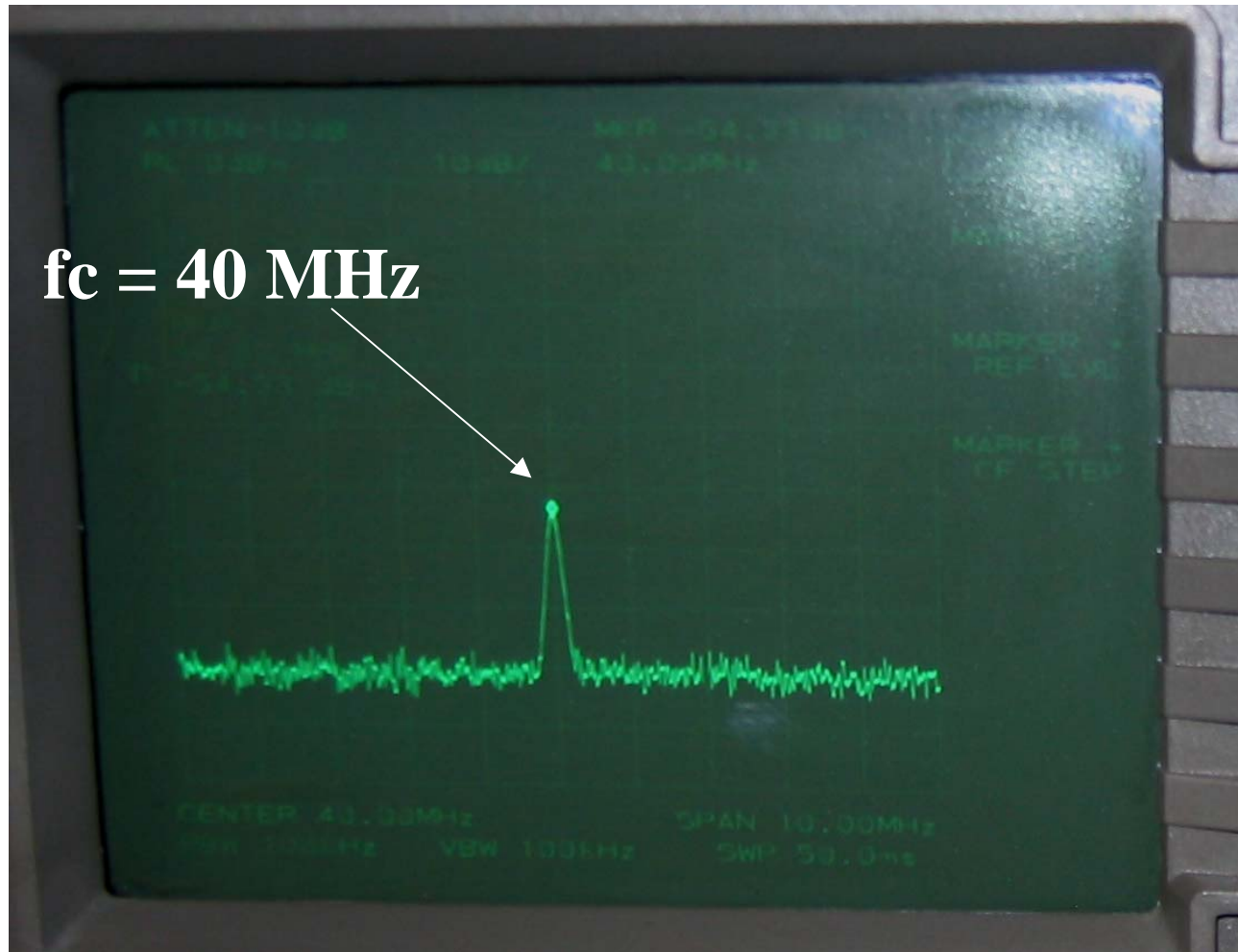
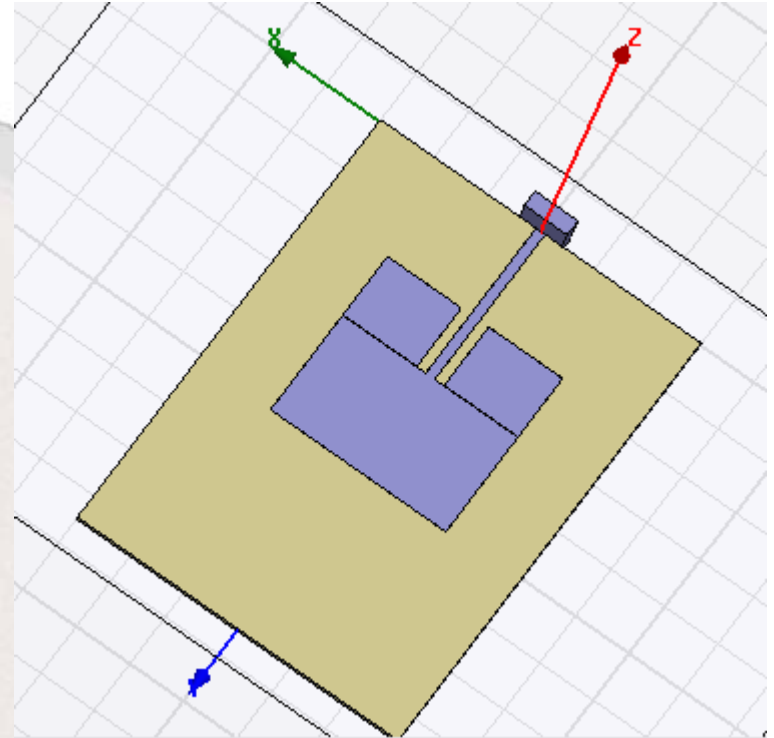


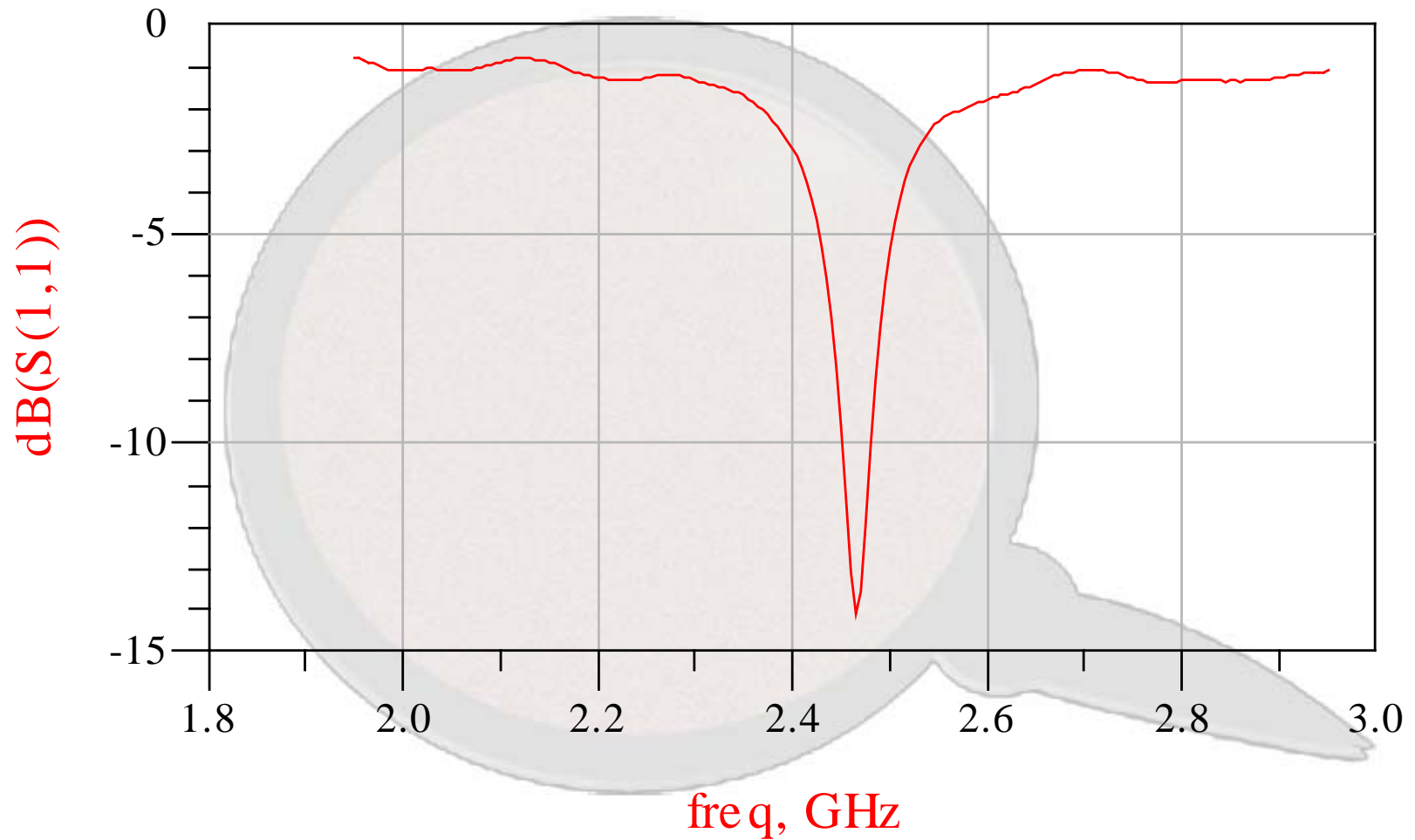
# Down-converted Signal



# A Narrowband Antenna



# Results from 8510 Network Analyser

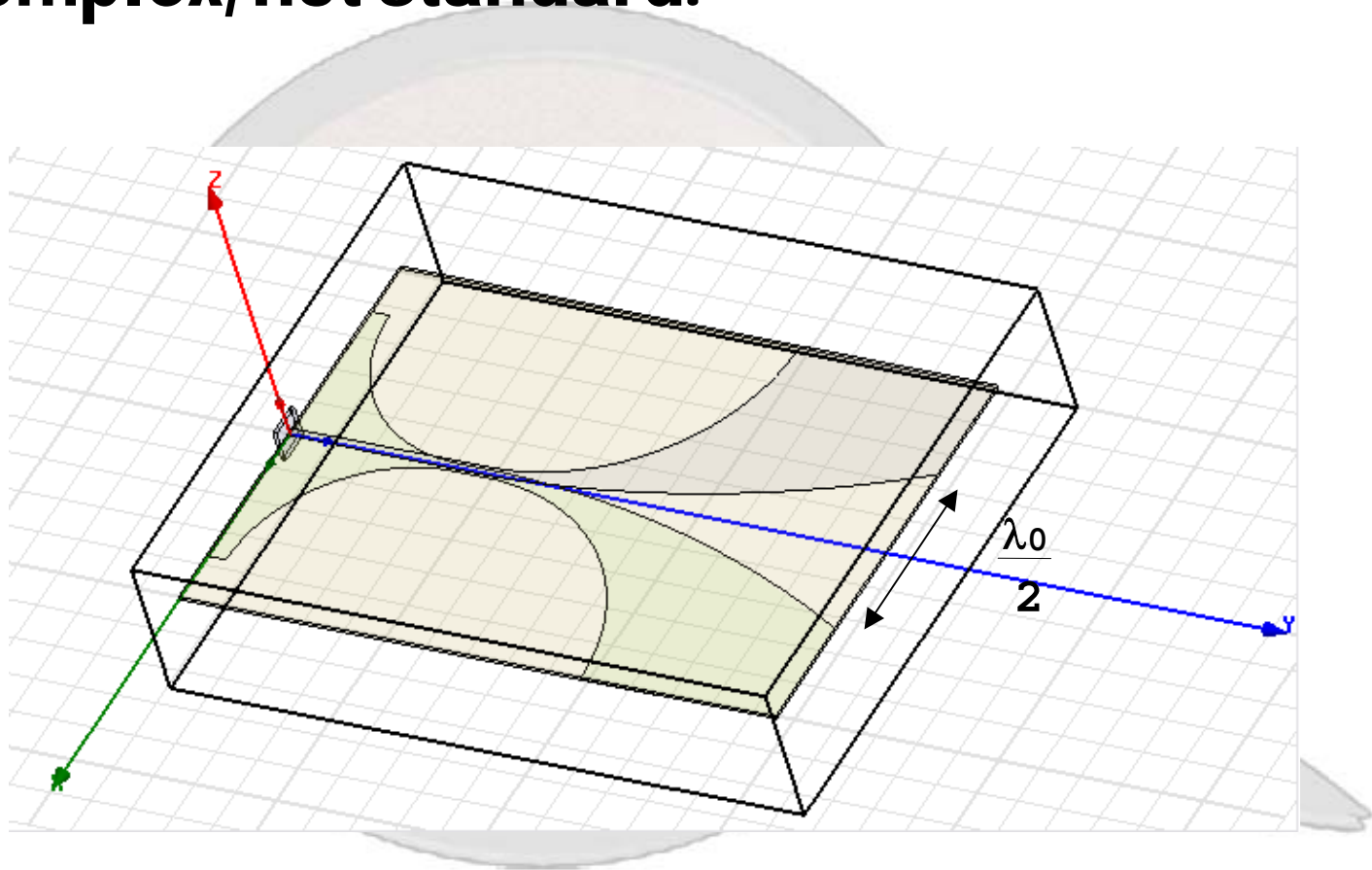


# Ultra-wideband Antennas

- **A challenge to design!**
- **Have not been around for ages**
- **Theory not established**

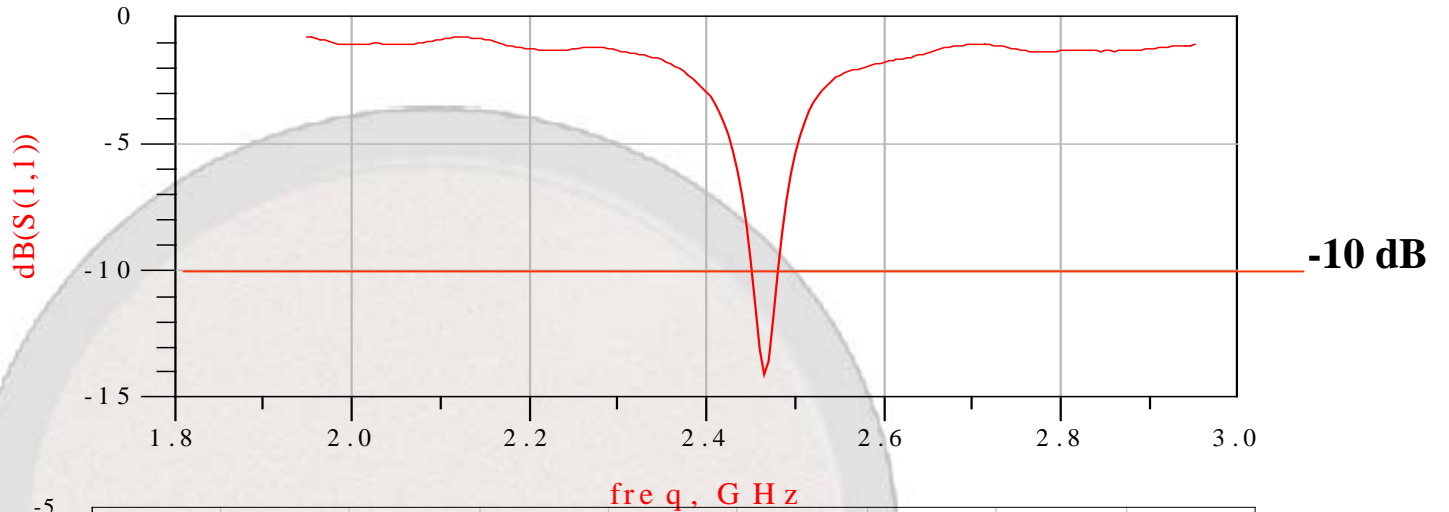
# Design of antenna

- **Complex, not standard.**

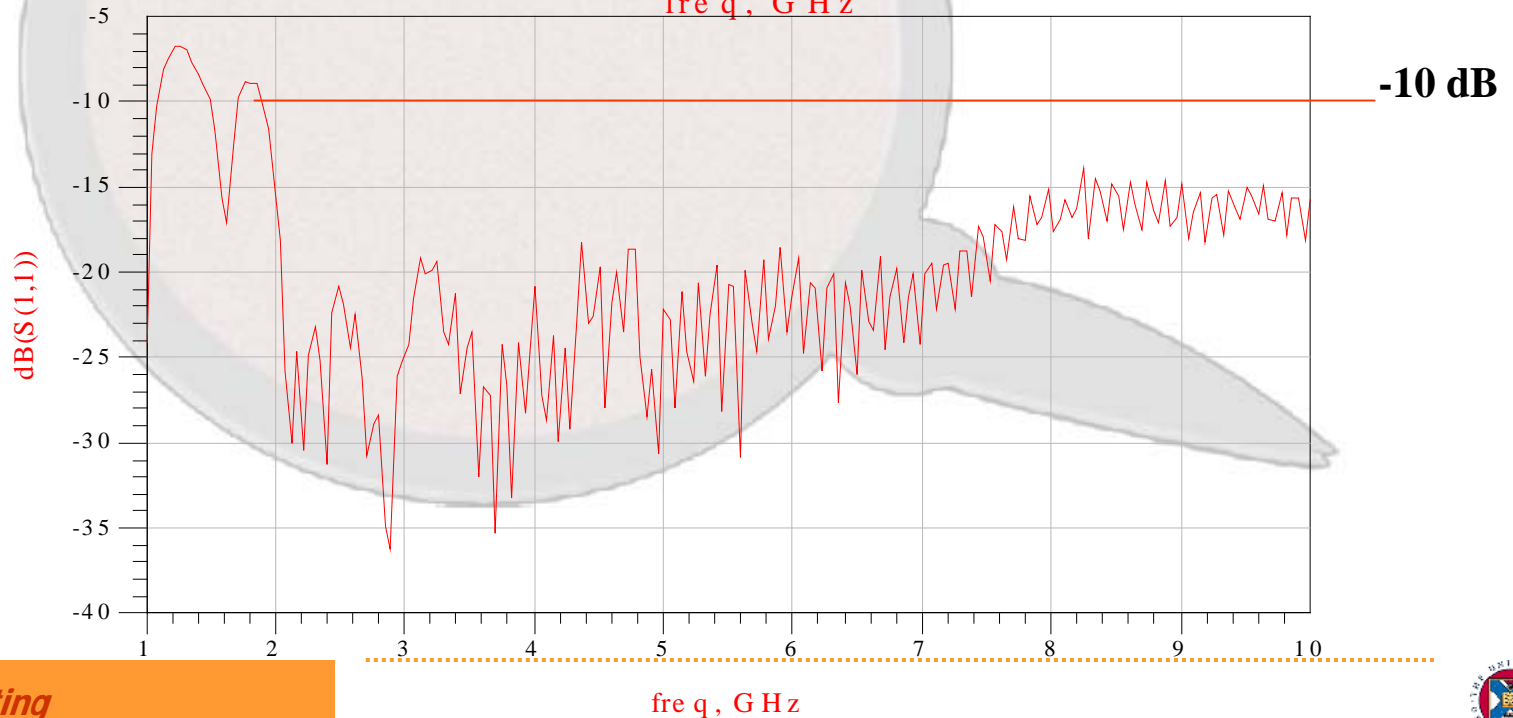


# Comparison with narrowband

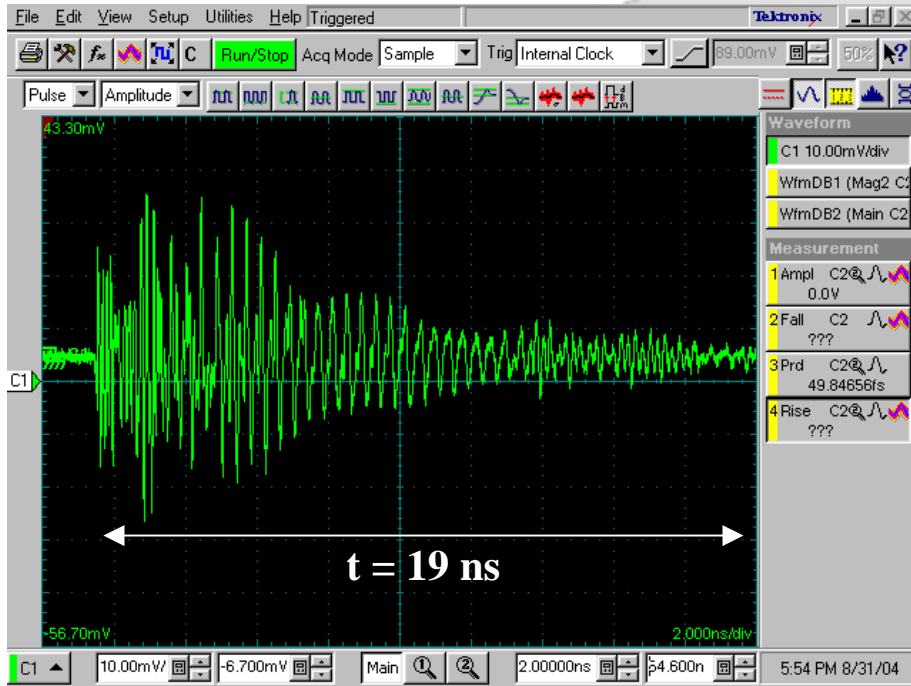
**Patch  
(Narrowband)**



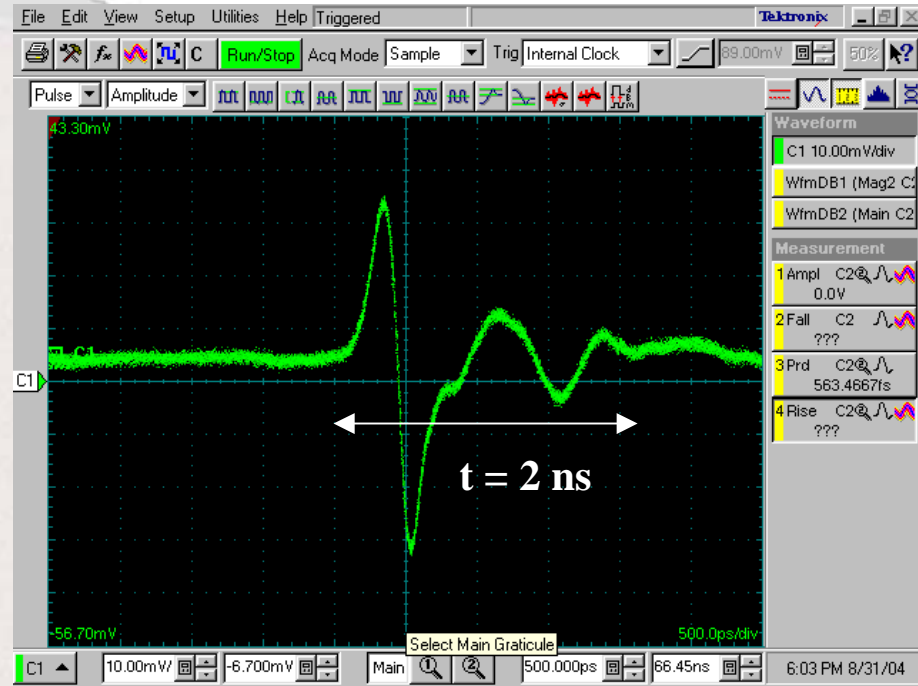
**Vivaldi  
(Wideband)**



# Time domain result



Narrowband Antenna (Patch)



Ultra-Wideband Antenna (Vivaldi)

## **Reducing size of Antennas:**

- **Frequency, permittivity**

## **Reduce Antenna losses:**

- **Design antenna for efficient operation**

## Design and use of Antennas for Ultra-Wideband and Narrowband systems

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