

**NVNA User's Forum**

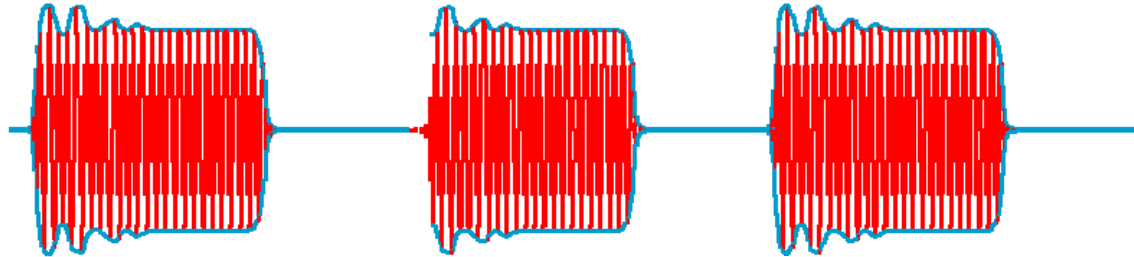
# Detection of Pulsed RF measurements

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## Introduction

**This talk only focuses on continuous pulsed mode measurements**



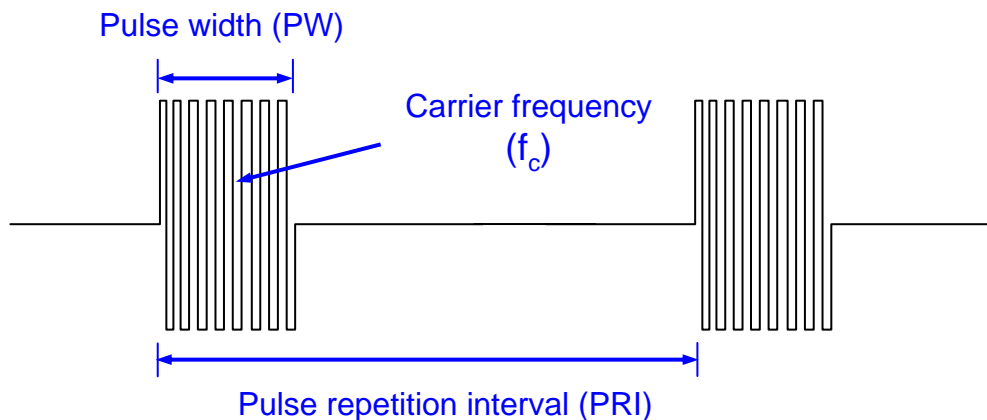
One can consider:

- Pulse to pulse measurements or single shot measurements
- Pulse profiling
- Burst of pulses

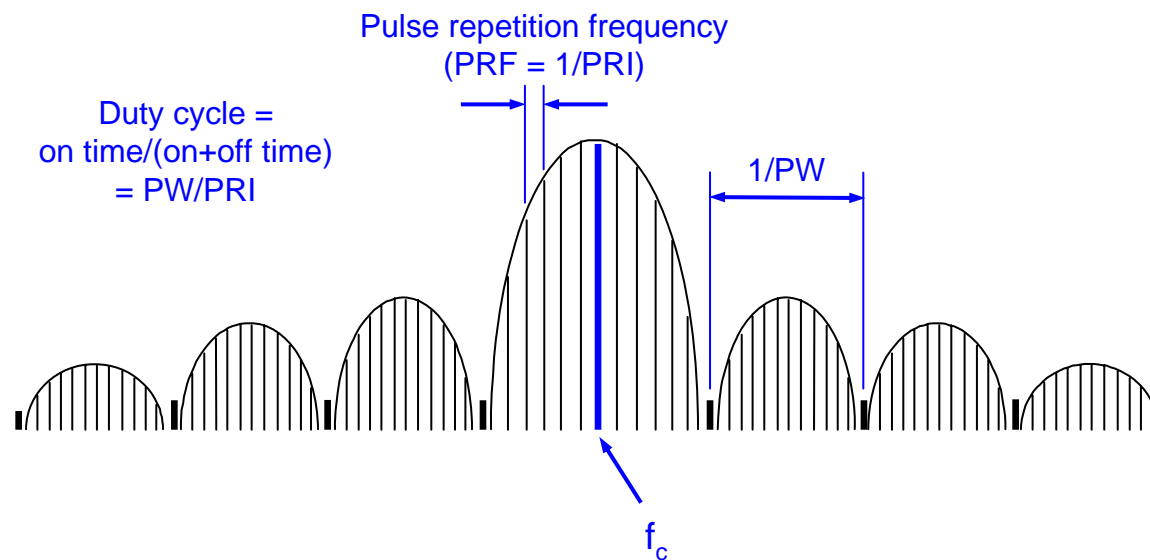
but this is another story...

# Terminology and definitions

**Time domain**

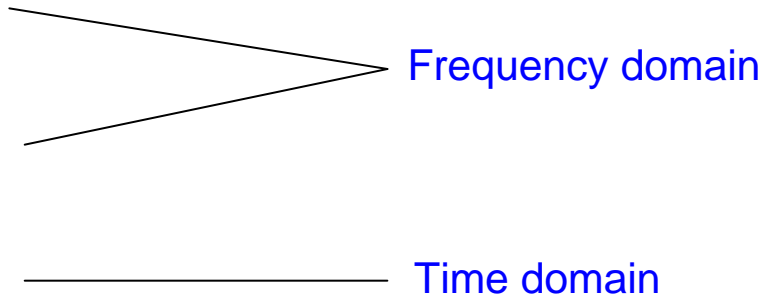


**Frequency domain**

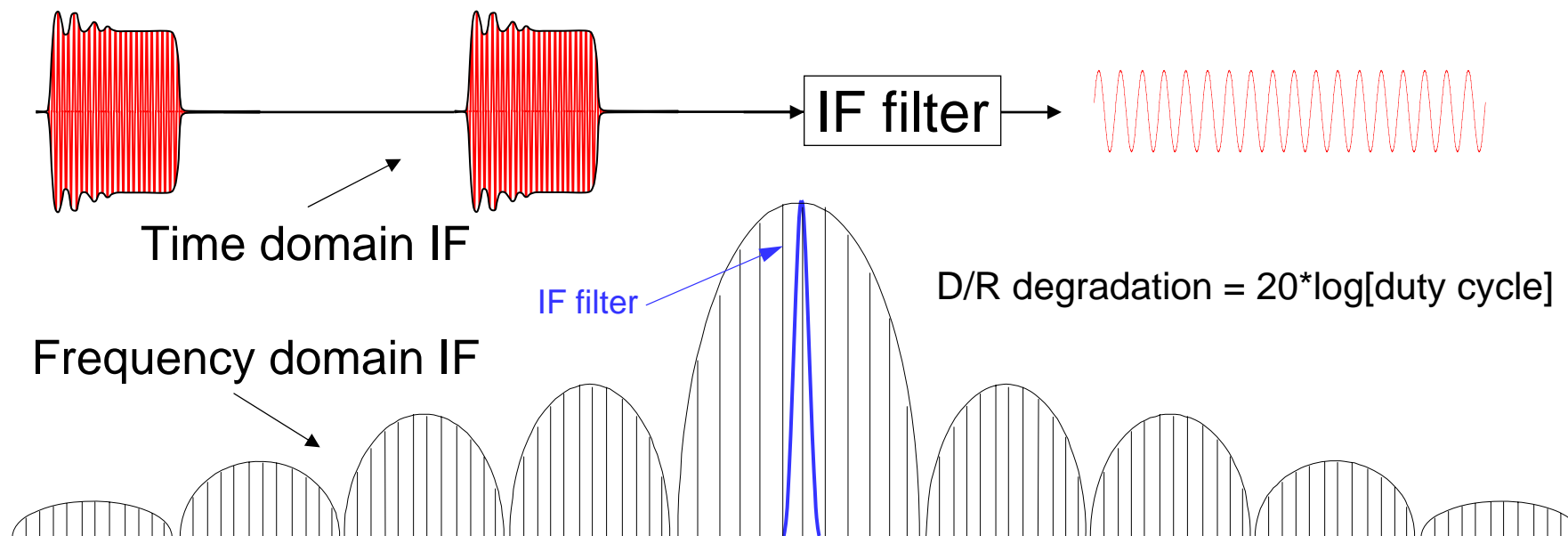


## Detection approaches

Three techniques will be briefly presented:

- IF narrowband detection
  - IF wideband detection
  - Stroboscopy
- 
- The diagram consists of three lines originating from the right side of the list items and pointing towards the left. The top two lines, corresponding to 'IF narrowband detection' and 'IF wideband detection', converge to a single point and are labeled 'Frequency domain'. The bottom line, corresponding to 'Stroboscopy', is horizontal and labeled 'Time domain'.
- Frequency domain
- Time domain

## IF Narrowband Detection

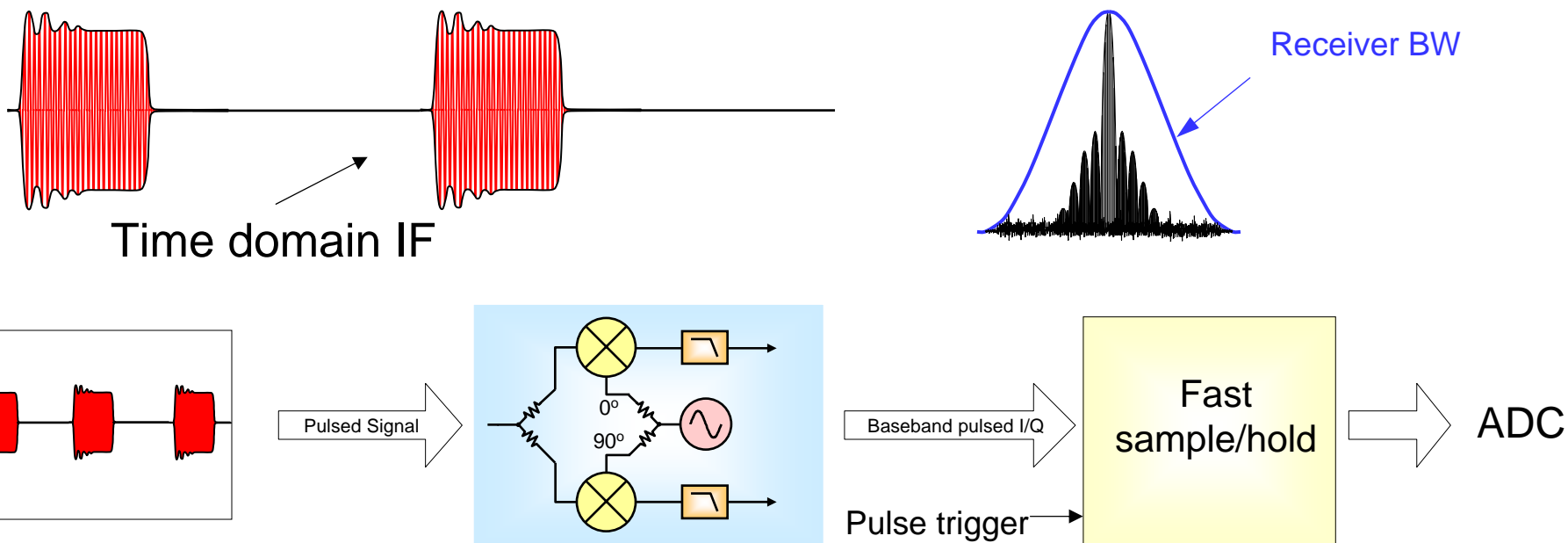


This IF filtering can be done with:

- Analog High Quality filters (Anritsu 500 Hz filter for pulsed 360)
- Digital filters (Agilent PNA)
- Synchronized digital filters: spectral nulling (Agilent PNA)

**Trade-off between IF bandwidth (dynamics) and measurement time**

# IF Wideband Detection



This approach was available with HP 8510 option Option 85108

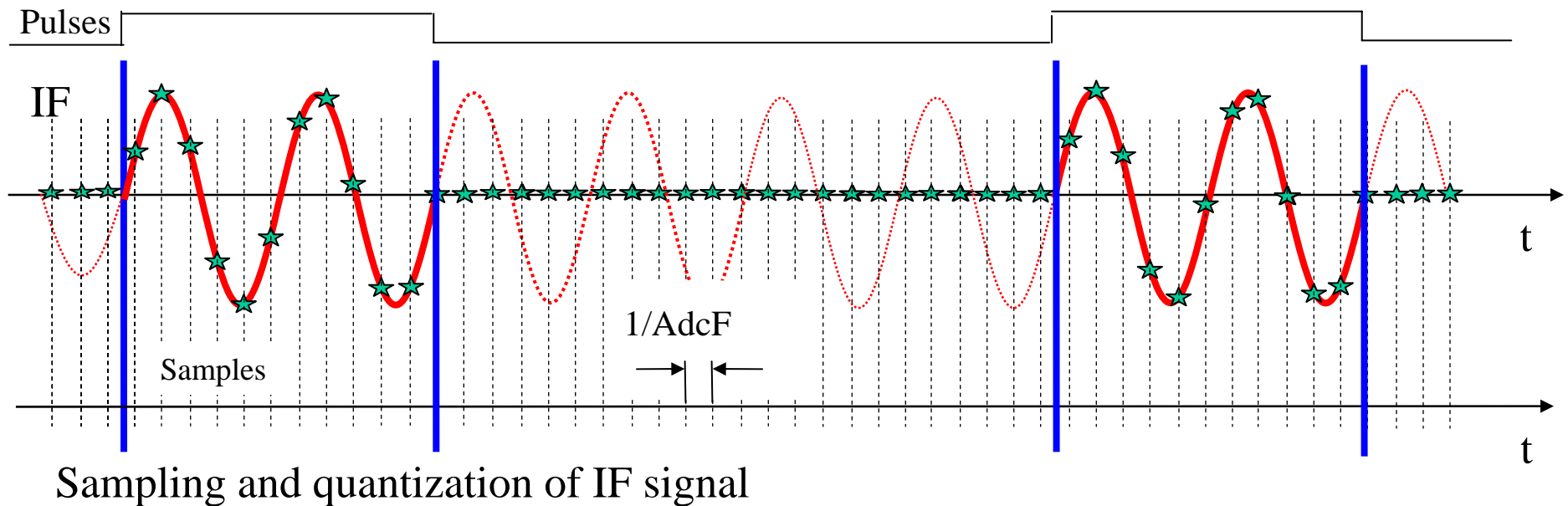
The PNA also proposes it, the work is done by computing, the IF bandwidth sets the minimal pulse period

An intermediate approach has been used by OSU with the LSNA, with spectrum line considered only in the first envelope lobe

**Very short pulsed measurements (< 5 μs) not available**

# Time domain stroboscopy

The ADC frequency depends on the pulse and RF sampling parameters



All samples of FiF are not to be considered : only during pulses. 2 ways :

- Adcs with large memory and always running, sorting of memory arrays ;
- Adcs with trigger and burst capabilities.

**The measurement time is increased, but the dynamical range is kept**