



ET 644 – Advanced Digital Signal Processing

Fall 2009

Department of Engineering and Technology
zhang@email.wcu.edu

session 7 DTFT vs. CTFT

Outline:

- Continuous Time Fourier Transform (CTFT) Sections 4.1.3 - 4.1.4
- Relationship between CTFT and DTFT - section 4.2.9
- Examples (also see aliaseg.m demo)

$$X(\omega) = F_s \sum_{k=-\infty}^{\infty} X_a\left(\frac{F_s}{2\pi}(\omega + 2k\pi)\right)$$

- Example 1. $x_a(t) = \frac{\sin(2\pi Wt)}{\pi t}$
- Example 2. $x_a(t) = \frac{\sin(\pi \frac{t}{T_p}) \cos(\pi \beta \frac{t}{T_p})}{\pi \frac{t}{T_p} 1 - 4\beta^2 \frac{t^2}{T_p^2}}$

This is a Raised Cosine Pulse used in digital communications.

$$0 < \beta < 1.$$