

Example 9-16: Stable System

Consider the LTI system whose impulse response is a square pulse of the form

$$h(t) = u(t+10) - u(t-10) = \begin{cases} 1 & -10 \le t < 10 \\ 0 & \text{otherwise} \end{cases}$$

To test to see if this system is stable, we simply substitute into (9.66) and check to see if the result is finite. That is

$$\int_{-\infty}^{\infty} |h(\tau)| d\tau = \int_{10}^{10} d\tau = 20 < \infty$$

Therefore this system is stable.

McClellan, Schafer and Yoder, Signal Processing First, ISBN 0-13-065562-7. Prentice Hall, Upper Saddle River, NJ 07458. © 2003 Pearson Education, Inc.