知识点Z1.11

单位脉冲序列与单位阶跃序列

主要内容：

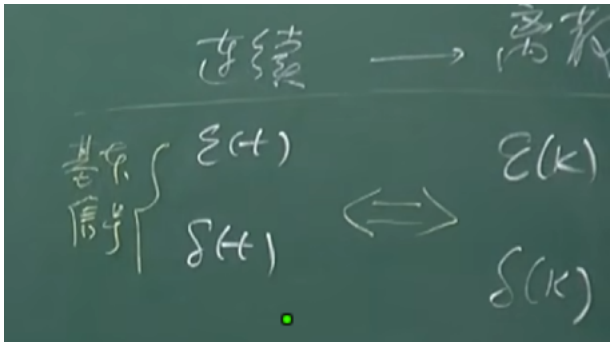
1.单位脉冲序列的定义

2.单位阶跃序列的定义

基本要求：

1.掌握单位脉冲序列的取样性质

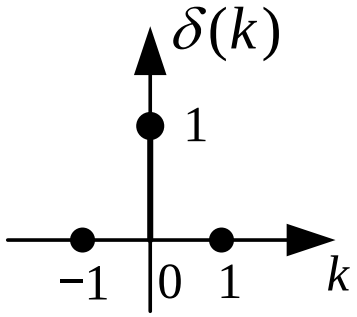
2.掌握单位脉冲序列与单位阶跃序列的关系公式



Z1.11 单位脉冲序列与单位阶跃序列

1.单位脉冲序列$\delta(k)$

$$\delta(k) \overset{\text{def}}{=} \begin{cases} 1, & k = 0 \\ 0, & k \neq 0 \end{cases}$$



取样性质： $f(k)\delta(k) = f(0)\delta(k)$

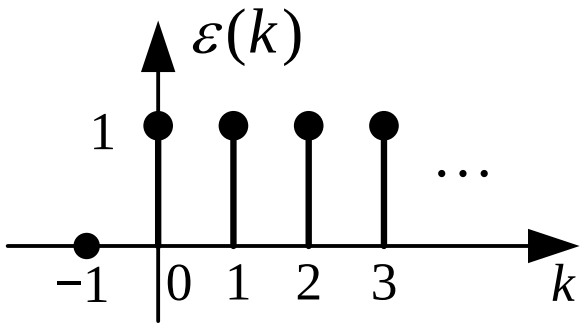
$$f(k)\delta(k-k_0) = f(k_0)\delta(k-k_0)$$

$$\sum_{k=-\infty}^{\infty} f(k)\delta(k) = f(0)$$

思考 $\sum_{k=-\infty}^{\infty}\delta(k) = ?$ **1** $\sum_{k=-\infty}^{2}(k-5)\delta(k-4) = ?$ **0**

2. 单位阶跃序列$\varepsilon(k)$

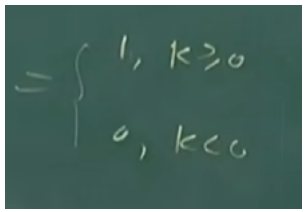
$$\varepsilon(k) \overset{\text{def}}{=} \begin{cases} 1, & k \geq 0 \\ 0, & k < 0 \end{cases}$$



3. $\varepsilon(k)$与$\delta(k)$的关系

$$\delta(k) = \varepsilon(k) - \varepsilon(k-1)$$

$$\varepsilon(k) = \sum_{i=-\infty}^{k} \delta(i)$$



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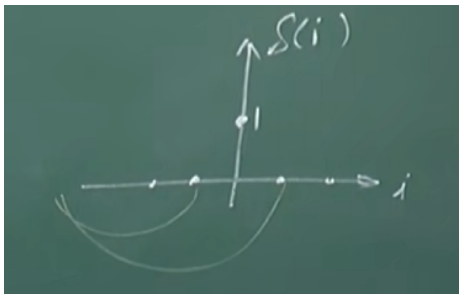

或 $$\varepsilon(k) = \sum_{j=0}^{\infty} \delta(k-j) = \delta(k) + \delta(k-1) + \ldots$$