PHYS 241: Signal Processing

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Abstract

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1 Introduction

2 Prerequisite knowledge

3 Basics & Voltage, Current and Resistance

3.1 Signal Types

3.1.1 Digital Signal

Definition 1. *A discretely sampled signal with a sequence of quantized values.*

3.1.2 Analogue

Definition 2. *A continuous signal (e.g., in time) representing (analogous to) some other quantity.*

Example 1. *Examples of analogue devices and computers are:*

- *thermometers*
- *sextants*
- *tide-predicting machine*

3.2 Circuits

3.2.1 DC

Definition 3. *Direct Current (DC) is a form of current where voltage and current are constant over time.*

DC Offset We often talk about adding a **DC offset** to an AC signal. This means adding a constant DC value to an AC signal. Doing this shifts the entire signal up or down relative to the 0 V level, without changing the shape of the AC signal.

Example 2. *Example of a source of DC current is a battery.*

3.2.2 AC

Definition 4. *Alternating Current (AC) is a form of current that changes over time, often in a sinusoidal manner.*

Example 3. *Example of a source of AC current is a transformer. Other examples of AC current are wall outlets.*