



# Total Variation

## 1 Why

We want a norm on the space of measures.

## 2 Definition

The *total variation* of finite measure is the variation measure of the base set. We show below that the total variation is a norm on the vector space of finite measures.

### 2.1 Notation

Let  $R$  denote the set of real numbers. Let  $(X, \mathcal{A})$  be a measurable sapce and  $\mu : X \rightarrow R$  be a finite signed measure. We denote the total variation by  $|\mu|$ .

Let  $|\mu|$  be the variation of  $\mu$ . Then,  $|\mu| = |\mu|(X)$ .