



Why

Suppose a measure is not interchangeable with another. Then what. We can separate out the troublesome piece; perhaps it can be handled separately.

Result

Proposition 1. *Let (X, \mathcal{A}) be a measurable space. Let μ be a measure on (X, \mathcal{A}) . Let ν be a finite signed measure or complex measure or σ -finite measure on (X, \mathcal{A}) . There there is a unique decomposition $\nu = \nu_a + \nu_s$ where $\nu_a \ll \mu$ and $\nu_s \perp \mu$.*

The above is also called *Lebesgue's Decomposition Theorem*

