



## Complete Inner Product Decomposition

**Proposition 1.** *Let  $(V, F)$  be a complete inner product space. Let  $M$  be a closed subspace. then*

$$H = M \oplus M^\perp.$$

*That is for all  $x \in V$ , there exists unique  $z \in M$  and  $q \in M^\perp$  such that  $x = z + w$ .*