

# Mutually Unbiased Bases

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Two orthogonal bases  $A$  and  $B$  of an  $n$ -dimensional Hilbert space are called *Mutually Unbiased* if for  $a_i \in A$  and  $b_j \in B$  holds:  $|(a_i, b_j)|^2 = \frac{1}{n}$  for each  $i, j \in \{1, \dots, n\}$ . A set  $\mathcal{B}$  of Mutually Unbiased Bases (MUBs) is a set of bases such that each two distinct bases  $B_i, B_j \in \mathcal{B}$  are mutually unbiased.

The bounds on the number of MUBs, dependent on the dimension  $n$ , will be derived. Also a construction for MUBs in  $\mathbb{C}^p$ , with  $p$  prime, will be showed. Finally, some open problems will be discussed.