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Bi-monotonic independence for pairs of algebras

According to Muraki's classification work, there are only five notions of independences in a natural sense: tensor, free, Boolean, monotonic, and anti-monotonic. Following Voiculescu's extension from free to bi-free independence, the notion of Boolean independence has been recently upgraded to bi-Boolean independence as well. In this talk, we consider a similar generalization in the framework of monotonic probability and introduce the notion of bi-monotonic independence for pairs of algebras. Time permitting, we will discuss related topics such as bi-monotonic cumulants, convolution, and a connection with operator-valued monotonic independence.