

Isometric dilations, von Neumann inequality and refined von Neumann inequality

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Abstract: It is well known that for an arbitrary n -tuple ($n > 2$) of commuting contractions, neither the existence of isometric dilation nor the celebrated von Neumann inequality holds in general. However, both of the above are true for a single contraction or a pair of commuting contractions, due to Sz.-Nagy and Ando, respectively. In this series of two talks, we will see three different classes of n -tuples of commuting contractions which possess isometric dilations and satisfy von Neumann inequality. Moreover, in most of the cases, we get the isometric dilations explicitly on some vector-valued Hardy spaces over the unit polydisc, and in some of the cases that explicitness helps us to refine von Neumann inequality in terms of algebraic variety in the closure of the unit polydisc in the n -dimensional complex plane.

In the first talk, after reviewing some basic theory of isometric dilation and Hardy space, I will introduce our first class of operator tuples and will talk about isometric dilation and von Neumann inequality of the finite rank tuples in that class. In the second talk, we will discuss the isometric dilation and von Neumann inequality for the general tuple in the first class and also the same for rest of two classes.