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On Multiple L_p -curvilinear-Brunn-Minkowski inequality

In this talk, the extension of the curvilinear summation for bounded Borel measurable sets to the L_p space for multiple power parameter $\bar{\alpha} = (\alpha_1, \dots, \alpha_{n+1})$ when $p > 0$ will be introduced. Based on this $L_{p,\bar{\alpha}}$ -curvilinear summation for sets and concept of *compression* of sets, the $L_{p,\bar{\alpha}}$ -curvilinear-Brunn-Minkowski inequality for bounded Borel measurable sets and its normalized version are established. Furthermore, by utilizing the hypo-graphs for functions, we enact a brand new proof of $L_{p,\bar{\alpha}}$ Borell-Brascamp-Lieb inequality, as well as its normalized version, for functions containing the special case of L_p Borell-Brascamp-Lieb inequality through the $L_{p,\bar{\alpha}}$ -curvilinear-Brunn-Minkowski inequality for sets. We also propose the multiple power $L_{p,\bar{\alpha}}$ -supremal-convolution for two functions together with its properties. Moreover, we introduce the definition of the surface area originating from the variation formula of measure in terms of the $L_{p,\bar{\alpha}}$ -curvilinear summation for sets as well as $L_{p,\bar{\alpha}}$ -supremal-convolution for functions together with their corresponding Minkowski type inequalities and isoperimetric inequalities for $p \geq 1$, etc. This talk is based on the joint work with Dr. Michael Roysdon.