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Cartan-Thullen theorem and Levi problem in context of generalised convexity

In the talk I will introduce analogues of the classical notions of the complex analysis to the setting of generalised convexity and I will demonstrate that the Cartan-Thullen theorem and its appropriate formulation in the context of generalised convexity, which I will present, can be regarded as consequences of the classical theorems of functional analysis: the Banach-Steinhaus theorem and the Banach-Alaoglu theorem. Furthermore, I will provide a characterisation of the domains of holomorphy, and their generalisations, as the spaces that are complete, or as the spaces exhaustible by suitably defined polytopes. I will also provide an abstract analogue of the Levi problem and its elementary resolution. My results allow also for a novel characterisation of Stein spaces as the holomorphically complete spaces, as well as show that the Bremermann-Lelong lemma is equivalent to the positive answer to the Levi problem.