Construction of some Generalized Inverses of Operators between Banach Spaces and their Selections, Perturbations and Applications

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In my presentation, continuous homogeneous selections for the set-valued metric generalized inverses T^∂ of linear operators T in Banach spaces are investigated by means of the methods of geometry of Banach spaces. Necessary and sufficient conditions in order that the set-valued metric generalized inverses T^∂ of bounded linear operators T have continuous homogeneous selections are given. Secondly, the perturbations of the Moore-Penrose metric generalized inverses for linear operators in Banach spaces are described. Using the notion of metric stable perturbation and the theorem of generalized orthogonal decomposition, under some assumptions we give some error estimates of the single-valued Moore-Penrose metric generalized inverses for bounded linear operators. Finally, the concepts of generalized regular points and narrow spectrum points of bounded linear operators on Hilbert spaces are introduced. It is proved that some properties of the narrow spectrum are the same as of the spectrum but some other properties are distinguished by these two notions. It is shown that the well known problem of the existence of invariant subspaces for bounded linear operators on separable Hilbert spaces can be restricted to the problem of the operators with the narrow spectrum only.