EQUIVALENCE BETWEEN MARKUSHEVICH SEMI-GREEDY AND ALMOST GREEDY BASES.

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ABSTRACT. Greedy bases allow us to represent elements of a Banach space with a series, built on a given system, whose coefficients are ordered (in absolute value) in decreasing form. The approximation with greedy bases (best m-approximant) is of nonlinear nature and it is linked to the notion of unconditionality. In order to work with more flexible structures, variants of the greedy concept arise, such as *semi-greedy Schauder bases*, *almost greedy Schauder bases* and more recently that of *branch greedy bases*. For example, the Haar Schauder basis of $L_1([0,1])$ is not unconditional and therefore not greedy but it turns out to be branch greedy convergent.

The concepts of semi-greedy and almost greedy bases, which were independently introduced, are closely related. Semi-greedy Schauder bases were introduced by S.J. Dilworth, N.J. Kalton and D. Kutzarova (2003). In their article, the authors show that every almost greedy Schauder basis is semi-greedy, and prove the converse for spaces with finite cotype. This implication was proved without the cotype restriction by P. Berná (2019), who, after noting that the proof of the implication (almost greedy $\implies$ semi-greedy) given in 2003 is also valid in the general context of Markushevich bases, asks whether the converse also holds for such bases.

In this talk, based on a joint work with Miguel Berasategui, the goal is to present these concepts, reaching an affirmative answer to this last problem.