**Banach spaces of functions of bounded generalized variation**

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(joint work with D. Apatsidis)

The spaces $V_2^0, V_2$ of functions of bounded quadratic variation have been thoroughly studied. One of the characteristic properties of the space $V_2^0$, is that it is separable with non separable dual, not containing $\ell_1$. Moreover, the second dual of $V_2^0$ naturally coincides with the space $V_2$. The subspace structure of the spaces $V_2^0, V_2$ is quite rich, as $c_0$ and $\ell_p, p \geqslant 2$ all embed into $V_2^0$ and $\ell_\infty$ embeds into $V_2 \cap C[0,1]$.

In the present lecture we will generalize the notion of variation, in order to obtain spaces $D_X^0, D_X$ of functions of bounded generalized variation, where $X$ is a reflexive space with an unconditional basis. These spaces share similar general properties with the spaces $V_2^0, V_2$, as they are separable with non separable dual, not containing $\ell_1$ and $(D_X^0)^{**}$ naturally coincides with $D_X$.

However, the subspace structure of these spaces is more homogeneous, as both $D_X^0$ and $D_X$ are saturated with subspaces of $X$. In particular, the spaces $D_2^0, D_2$ are $\ell_2$ saturated and the spaces $D_T^0, D_T$ are saturated with subspaces of Tsirelson space, hence they do not contain $c_0$ or $\ell_p$.