

# EXTENDED BERNOULLI COMPARISON

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The talk will be devoted to the contraction property of Bernoulli canonical process. The classical result known as the Bernoulli comparison states that if  $(\varepsilon_i)_{i \geq 1}$  are independent Rademacher random variables then we can compare  $\mathbf{E} \sup_{t \in T} \sum_{i \geq 1} \varphi_i(t) \varepsilon_i$  with  $\mathbf{E} \sup_{t \in T} \sum_{i \geq 1} t_i \varepsilon_i$ , where a function  $\varphi = (\varphi_i)_{i \geq 1} : \ell^2 \supset T \rightarrow \ell^2$ , satisfies certain conditions. Originally, it is assumed that each of  $\varphi_i$  is a contraction. We relax this assumption towards comparison of Gaussian parts of increments, which can be described in the following way. For all  $s, t \in T$ ,  $p \geq 0$

$$\inf_{|I^c| \leq Cp} \sum_{i \in I} |\varphi_i(t) - \varphi_i(s)|^2 \leq C^2 \inf_{|I^c| \leq p} \sum_{i \in I} |t_i - s_i|^2,$$

where  $C \geq 1$  is an absolute constant and  $I \subset \mathbb{N}$ ,  $I^c = \mathbb{N} \setminus I$ . Moreover, we show that if we can compare moments of Bernoulli processes then we can also compare the suprema under the additional assumption about supports of points  $t \in T$ . We apply those results to the question about comparability of weak and strong moment of Bernoulli series in Banach space.

This is based on the joint work with Witold Bednorz.

## REFERENCES

- [1] Witold Bednorz and Rafał Martynek, *On a contraction property of Bernoulli canonical processes*, to appear in Bulletin Polish Acad. Sci. Math. (2019), arXiv:1812.04399.