EPIC MATH BATTLE OF HISTORY: GROTHENDIECK VS NIKODYM - ROUND 1

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Abstract. For a Boolean algebra $\mathbb{B}$ we say that it has the Grothendieck property if every weak*-convergent sequence of measures on $\mathrm{St}(\mathbb{B})$[1] is also weakly convergent. We say that $\mathbb{B}$ has the Nikodym property, if every pointwise convergent sequence of measures on $\mathbb{B}$ is bounded in norm.

In 1984 Talagrand showed that under the continuum hypothesis (CH) there is a Boolean algebra with the Grothendieck property and without Nikodym property, but the problem of the existence of such an algebra is still open in ZFC.

We will show that the existence of a Boolean algebra with the Grothendieck property and without the Nikodym property is consistent with ¬CH.

In the first part of the talk (2nd part will be given by Damian Głodkowski) we will introduce the notion of balanced sets and show that Boolean algebras consisting of balanced sets do not have the Nikodym property.

REFERENCES

1. Damian Głodkowski and Agnieszka Widz, *Epic math battle of history: Grothendieck vs Nikodym*, arXiv:2401.13145 (2024).

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[1]the Stone space of $\mathbb{B}$