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Nonseparable growth of ω supporting a strictly positive measure

Joint work with Piotr Borodulin-Nadzieja.

A compact space K is called a growth of ω if there exists a compactification $\gamma\omega$ of ω such that K is homeomorphic to $\gamma\omega\backslash\omega$. It is well-known that every separable compact space is a growth of ω and, moreover, every such space carries a strictly positive measure, i.e. measure positive on every nonempty open subset.

In paper [2] we have found several ZFC examples of a nonseparable growths X of ω on which are defined strictly positive measures. This extends results of Bell [1], van Mill [5] and Todorčević [4], who have found compactifications $\gamma\omega$ of ω with ccc nonseparable $\gamma\omega\backslash\omega$, and the result of Drygier and Plebanek [3], who have provided a nonseparable growth of ω supporting a strictly positive measure under the assumption $\mathfrak{b} = \mathfrak{c}$.

During the talk I will present a construction of a non-separable growth of the form $\mathrm{ult}(\mathfrak{A})$, where $\mathfrak{A}$ is a Boolean subalgebra of $Bor(2^\omega)$ containing all clopen subsets of 2^ω. I will show that the Lebesgue measure on 2^ω is positive on every nonzero element of $\mathfrak{A}$, thus there is a strictly positive measure on $\mathrm{ult}(\mathfrak{A})$.

[1] Bell, M.G., Compact ccc nonseparable spaces of small weight. Proceedings of the 1980 Topology Conference, Vol. 5, (1981), 11–25.

[2] Borodulin-Nadzieja, P., Żuchowski, T., On non-separable growths of ω supporting measures. preprint.

[3] Drygier, P., Plebanek, G., Nonseparable growth of the integers supporting a measure. Topology and its Applications, Vol. 191, (2015), 58–64.

[4] Todorčević, S., Chain-condition methods in topology. Topology and its Applications, Vol. 101, no. 1, (2000), 45–82.

[5] van Mill, J., Weak P-points in Čech-Stone compactifications. Trans. Amer. Math. Soc., Vol. 273, no. 2, (1982), 657–678.