On strongly and strictly pseudoconvex domains

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In this talk, spanning over two meetings (7.04.2025, 14.04.2025), I intend to present the proof of the following result.

Theorem: Every compact set in $\mathbb{C}^n$ of positive measure contains a polynomially convex compact minimum set of positive measure such that it's measure can be chosen arbitrarily close to the measure of the initial set.

The minimum sets above are understood as follows.

Definition: The **minimum set** of a strictly $PSH(\Omega)$ function φ is the set $K \subseteq \Omega$ such that

- $\varphi\big|_K = C = const$
- $\varphi(z) \geq C$ for all $z \in \Omega$
- $\varphi(z) > C$ for all $z \in \Omega \setminus K$

In the first part of the talk, I comment on the notions of strongly and strictly pseudoconvex domains, the relations between them, and present some counter-intuitive examples, when the assumptions on regularity are not strong enough.

In the second part, I prove the above theorem. The proof itself requires several lemmas an results from plane topology are used. The theorem generalizes previous results by the author and S.Dinew '16 and '19.