

Perfect Polish space

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My questions seem to be getting more and more obscure. Here goes:

Starting for a particular subset of my perfect set, I've managed to come up with finite increasing sequences of perfect and nowhere perfect sets. No matter what the answer is, it seems to me that it will rely on the Cantor-Bendixon theorem, but it isn't straightforward at all, as perfect sets very often contain open subsets.

Can a perfect set in a Polish space be the disjoint union of a perfect set and a countable open set? (Are there even countable open sets in Polish topologies? Thinking about countable open sets in completely metrizable topologies makes my head hurt too much to figure it out).

As always, references and (counter-)examples are appreciated.

Thanks,
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