On the equivalence of Strongly and Dually CPT graphs

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A poset is a containment of paths in a tree (CPT) if it admits a representation by containment where each element of the poset is represented by a path in a tree and two elements are comparable in the poset if the corresponding paths are related by the inclusion relation. Recently Alcón, Gudiño and Gutierrez 2018 introduced proper subclasses of CPT posets, namely dually-CPT, and strongly-CPT (or strong-CPT). A poset $\mathbf{P}$ is dually-CPT, if $\mathbf{P}$ and its dual $\mathbf{P}^d$ both admit a CPT-representation. A poset $\mathbf{P}$ is strongly-CPT, if $\mathbf{P}$ and all the posets that share the same underlying comparability graph admit a CPT-representation. Where as the inclusion between dually-CPT and CPT was known to be strict. It was raised as an open question by Alcón, Gudiño and Gutierrez 2018 whether strongly-CPT was a strict subclass of dually-CPT. We provide a proof that both classes actually coincide.

Keywords: CPT, Poset, Comparability graphs