Let $G$ be a graph. $w : V(G) \to [0,1]$ is good if $\exists v \in V(G)$ such that $w(v) = 1$.

**DEF** For $c \in [\frac{1}{2}, 1)$ define a $(w,c,d)$-balanced separator in $G$ is $S \subseteq V(G)$ s.t.

- $|S| \leq d$ and
- for every component $D$ of $G \setminus S$
  - $\exists v \in D$ s.t. $w(v) \leq c$.

**THM** (Harvey & Wood) If $\exists c,d$ s.t. $G$ has a $(w,c,d)$-separator for every good $w$, then $\text{tw}(G) \leq f(c,d)$. 
Let \( y \leq 2^{|v(G)|} \) closed under taking subsets.

**DEF** For \( c \in \Sigma_{y,1}^1 \) a \((w,c,y)\)-balanced separator on \( G \) is \( s \in Y \) s.t. for every component \( D \) of \( G \setminus s \) we have \( \sum_{v \in D} w(v) \leq c. \)

**QUESTION** Assume \( \exists c \in \Sigma_{y,1}^1 \) s.t. \( G \) has a \((w,c,y)\)-balanced separator for every good \( w \).

Does \( G \) have a tree decomposition \((T, \mathcal{X})\) s.t. \( \forall t_1, t_2 \in V(T) \) with \( t_1 \neq t_2 \) we have \( x(t_1) \cap x(t_2) \in Y \)?