Discussion on Generalising IPCO, quasi isometric embedding

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1 Directions

Lemma 1. *Let G be a series parallel graph, v be any vertex, and P be any isometric path. Then there is an isometric subgraph H of G with bounded pathwidth that contains P and r.*

Question 1. *Is it possible to use Lemma 1 to show that K_4-asymptotic minor free graphs admit a quasi-isometry with additive distortion on K_4 minor free graphs?*

For integers $a \geq 1, b \geq 0$, (a,b)-*quasi-isometric embedding* of a graph H in a graph G is a map $f\colon V(H) \to V(G)$ such that for $u, v \in V(H)$, $\frac{1}{a}\mathsf{d}_H(u,v) + b \leq \mathsf{d}_G(f(a), f(b)) \leq a.\mathsf{d}_H(u,v) + b$. A graph class $\mathcal{G}$ contains a graph H, as a *quasi-isometric minor* if for all $a \geq 1, b \geq 0$ there is a graph $G \in \mathcal{G}$ such that there is a (a,b)-quasi-isometric embedding of H in G.

Question 2. *For an integer $k \geq 3$, characterise graphs that does not contain a cycle of order k as a quasi-isometric minor.*

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