Hom complex of Mapping cylinders of graphs

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Let $\mathcal{G}$ denote the category whose objects are undirected graphs without multiple edges and morphisms are graph homomorphisms. We will define the notion of double mapping cylinder in the category $\mathcal{G}$. Let $\mathcal{G}'$ be subcategory of $\mathcal{G}$, whose objects do not contain $P_3$ as an induced subgraph. We will show that the Hom complex functor $\text{Hom}(T, \_)$ which was defined by Lovász maps double mapping cylinders in graphs to homotopy pushouts in topological spaces where $T$ is a graph in $\mathcal{G}'$.

References