Prodsimplicial and p-path complexes on directed graphs

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Consistently oriented (CO) graphs have a unique source and target with no cycles and can be used to model DNA rearrangement processes in certain specis of ciliates. We study CO graphs by computing their homology groups under different complexes. A prodsimplicial complex uses Cartesian products of directed simplices, while a path complex considers restrictions of the boundary operator on paths of different lengths. We compute the homology groups obtained for different graphs under both types of complexes and compare where they differ or coincide.

Keywords: directed graphs, digraph homology, prodsimplicial complex, path complex