

Path Graphs, Clique Trees, and Flowers¹

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Abstract: A classical result by Lekkerkerker and Boland showed that interval graphs are precisely the chordal graphs that do not have asteroidal triples [2]. Similar to Lekkerkerker and Boland, Cameron, Hoàng and Lévêque gave a characterization of directed path graphs by a “special type” of asteroidal triple, and asked whether or not there was such a characterization for path graphs [1]. We give strong evidence that asteroidal triples alone are insufficient to characterize the family of path graphs, and give a new characterization of path graphs via a forbidden induced subgraph family that we call sun systems. Key to our new characterization is the study of asteroidal sets in sun systems, which are a natural generalization of asteroidal triples.

References

- [1] Cameron, K., Hoàng, C.T., Lévêque, B.: Characterizing directed path graphs by forbidden asteroids. *Journal of Graph Theory* 68(2), 103-112 (2011)
- [2] Lekkerkerker, C.G, Boland, J.C.: Representation of a finite graph by a set of intervals on the real line. *Fundamenta Mathematicae* 51, 45-64 (1962)

¹With apologies to Jack Edmonds.