

The structure of graphs excluding Gem and \hat{K}_4 as induced minors

Jarosław Błasiok – School of Engineering and Applied Sciences, Harvard University, United States

Marcin Kamiński – Institute of Computer Science, University of Warsaw, Poland

Jean-Florent Raymond – Institute of Computer Science, University of Warsaw, Poland and LIRMM –
Université de Montpellier

Théophile Trunck – LIP, ÉNS de Lyon

Abstract:

A graph H is an *induced minor* of a graph G if it can be obtained by contracting an induced subgraph of G . When H is not an induced minor of G , then G is said to be *H -induced minor-free*. No decomposition theorem of H -induced minor-free graphs is known in the general case, unlike H -minor-free graphs.

We give two decomposition theorems corresponding to the cases $H = \text{Gem}$ and $H = \hat{K}_4$, where Gem can be constructed by adding a dominating vertex to P_4 and \hat{K}_4 by adding a vertex of degree 2 to K_4 . Our motivation for the choice of these two graphs was a study of the well-quasi-ordered graph classes excluding one graph as induced minors.