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The excluded minor structure theorem with planarly embedded wall

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Abstract

A graph is “nearly embedded” in a surface if it consists of graph G_0 that is embedded in the surface, together with a bounded number of vertices having no large transactions. It is shown that every large wall (or grid minor) in a nearly embedded graph, many rows of which intersect the embedded subgraph G_0 of the near-embedding, contains a large subwall that is planarly embedded within G_0 . This result provides some hidden details needed for a strong version of the Robertson and Seymour’s excluded minor theorem as presented in: T. Böhme, K. Kawarabayashi, J. Maharry and B. Mohar, Linear connectivity forces large complete bipartite minors, *J. Combin. Theory, Ser. B* **99** (2009), 557–582.

Keywords: Graph, graph minor, surface, near-embedding, grid minor, excluded minor.

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Izrek o strukturi izključenih minorjev z ravninsko vloženim zidom

Povzetek

V članku obravnavamo grafe, ki so “skoraj vloženi” na ploskev. Tak graf sestoji iz grafa G_0 , vloženega na ploskev, in iz manjšega števila vozlišč, ki nimajo veliko transakcij. Izkaže se, da vsak velik zid (oz. mrežni minor) v skoraj vloženem grafu, katerega številni sloji sekajo vloženi podgraf G_0 skoraj vloženega grafa, vsebuje velik podzid, planarno vložen znotraj G_0 . Ta naš rezultat razkriva nekatere skrite podrobnosti, potrebne za dokaz krepkejše verzije Robertsonovega in Seymourjevega izreka o izključenih minorjih, predstavljenega v članku: T. Böhme, K. Kawarabayashi, J. Maharry and B. Mohar, Linear connectivity forces large complete bipartite minors, *J. Combin. Theory, Ser. B* **99** (2009), 557–582.

Ključne besede: Graf, grafovski minor, ploskev, skoraj-vložitev, mrežni minor, izključeni minor.