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Linear-time computation of a linear problem kernel for dominating set on planar graphs.
(English) [Zbl 1352.68119](#)

Marx, Dániel (ed.) et al., Parameterized and exact computation. 6th international symposium, IPEC 2011, Saarbrücken, Germany, September 6–8, 2011. Revised selected papers. Berlin: Springer (ISBN 978-3-642-28049-8/pbk). Lecture Notes in Computer Science 7112, 194–206 (2012).

Summary: We present a linear-time kernelization algorithm that transforms a given planar graph G with domination number $\gamma(G)$ into a planar graph G' of size $O(\gamma(G))$ with $\gamma(G) = \gamma(G')$. In addition, a minimum dominating set for G can be inferred from a minimum dominating set for G' . In terms of parameterized algorithmics, this implies a linear-size problem kernel for the NP-hard Dominating Set problem on planar graphs, where the kernelization takes linear time. This improves on previous kernelization algorithms that provide linear-size kernels in cubic time.

For the entire collection see [\[Zbl 1238.68016\]](#).

MSC:

- [68Q25](#) Analysis of algorithms and problem complexity
- [05C10](#) Planar graphs; geometric and topological aspects of graph theory
- [05C69](#) Vertex subsets with special properties (dominating sets, independent sets, cliques, etc.)
- [05C85](#) Graph algorithms (graph-theoretic aspects)

Cited in **1** Review
Cited in **6** Documents

Full Text: [DOI](#)

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