# A new Exact-Subgraph-Based Hierarchy for Stable Set

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**Abstract**

One of several hierarchies towards the stability number of a graph is the exact subgraph hierarchy (ESH). On the first level it computes the Lovász theta function as semidefinite program (SDP) with a matrix variable of order n+1 and n+m+1 constraints. On the k-th level it adds all exact subgraph constraints for subgraphs of order k to the SDP.

We introduce the compressed ESH (CESH), a variant of the ESH that computes the Lovász theta function through a smaller SDP, which seems favorable. Furthermore, we investiage scaled ESCs (SESCs), which are a more natural way to represent exactness for the CESH. We present both computational and theoretical findings for the CESH and SECSs.

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