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Approximating Max-Cut on Bounded Degree Graphs: Tighter Analysis of the FKL Algorithm

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Abstract: In this note, we describe a $\alpha_{GW}+\tilde{\Omega}(1/d^2)$-factor approximation algorithm for Max-Cut on weighted graphs of degree at most d. Here, $\alpha_{GW} \approx 0.878$ is the worst-case approximation ratio of the Goemans-Williamson rounding for Max-Cut. This improves on previous results for unweighted graphs by Feige, Karpinski, and Langberg and Floren. Our guarantee is obtained by a tighter analysis of the solution obtained by applying a natural local improvement procedure to the Goemans-Williamson rounding of the basic SDP strengthened with triangle inequalities.

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