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Stability version of Dirac's theorem and its applications for generalized Turán problems

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In 1952, Dirac proved that every 2-connected *n*-vertex graph with the minimum degree k + 1 contains a cycle of length at least min $\{n, 2(k + 1)\}$. Here we obtain a stability version of this result by characterizing those graphs with minimum degree k and circumference at most 2k + 1.

We present applications of the above-stated result by obtaining generalized Tur\'an numbers. In particular, for all $\ell \geq 5$ we determine how many copies of a five-cycle as well as four-cycle are necessary to guarantee that the graph has a circumference larger than ℓ . In addition, we give new proof of Luo's Theorem for cliques using our stability result.

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