STABILITY PROPERTIES OF THE
GENERALIZED CHERNOFF INEQUALITY

LI GAO AND YILING WANG

Abstract. In this short note we will present two stability properties of the Chernoff-Ou-Pan in-equality, newly obtained in [6], which states that if K is a convex domain in the plane $\mathbb{R}^2$ with area $a(K)$, then one gets

$$a(K) \leqslant \frac{1}{k} \int_0^{\frac{\pi}{k}} \omega_k(\theta) w_k \left(\theta + \frac{\pi}{k} \right) d\theta,$$

where $w_k(\theta)$ is defined in [6] (see also §3 below), and the equality holds if and only if K is a circular disc.

Mathematics subject classification (2010): 52A38,52A40.
Keywords and phrases: Stability, convex domains, Chernoff-Ou-Pan inequality, Fourier series.

REFERENCES

[1] P. R. CHERNOFF, *An area-width inequality for convex curves*, Amer. Math. Monthly **76**, 1 (1969), 34–35.
[2] B. FUGLEDE, *Stability in the isoperimetric problem*, Bull. London Math. Soc. **18** (1986), 599–605.
[3] H. GROEMER, *Stability properties of geometric inequalities*, Amer. Math. Monthly **97** (1990), 382–394.
[4] H. GROEMER, *Stability properties of geometric inequalities*, In: Handbook of Convex Geometry, P.M. Gruber and J.M. Wills (eds), North Holland, 125–150, 1993.
[5] C. C. HSIUNG,, *A First Course in Differential Geometry*, Pure & Applied Math., Wiley, New York, 1981.
[6] K. OU & S. L. PAN *Some remarks about closed convex curves*, Pacific J. Math., **248** (2010), 393–401.
[7] S. L. PAN & H. P. XU, *Stability of a reverse isoperimetric inequality*, J. Math. Anal. Appl. **350** (2009), 348–353.

Mathematical Inequalities & Applications
www.ele-math.com
mia@ele-math.com