

HARDY INEQUALITIES FOR SOME NON-CONVEX DOMAINS

WALEED ABUELELA

Abstract. Considering two different geometrical conditions, we obtain some new Hardy-type inequalities for non-convex domains in \mathbb{R}^n . In order to do so, we study the three-dimensional case and then generalise the approach to the n -dimensional case.

Mathematics subject classification (2010): 26Dxx, 26D07, 26D10, 34A40.

Keywords and phrases: Hardy inequality, non-convex domains.

REFERENCES

- [1] A. ANCONA, *On strong barriers and an inequality of Hardy for domains in \mathbb{R}^n* , J. London Math. Soc., 34(2): 274–290, (1986.)
- [2] A. BALINSKY, A. LAPTEV AND A. V. SOBOLEV, *Generalized Hardy inequality for magnetic Dirichlet forms*, J. Statistical Physics, 116: 507–521, (2004).
- [3] M. SH. BIRMAN AND A. LAPTEV, *The negative discrete spectrum of a two-dimensional Schrödinger operator*, Comm. Pure. Appl. Math., XLIX: 967–997, (1996).
- [4] E. B. DAVIES, *Heat kernels and spectral theory*, Cambridge University Press, (1989).
- [5] E. B. DAVIES, *Spectral theory and differential operators*, Cambridge University Press, (1995).
- [6] E. B. DAVIES, *The Hardy constant*, Quart. J. Math. Oxford, 46(2): 417–431, (1995).
- [7] E. B. DAVIES, *A review of Hardy inequalities*, The Maz'ya anniversary collection, Vol. 2, oper. Theory Adv. Appl. Birkhäuser, Basel, 110: 55–67, (1999).
- [8] G. H. HARDY, J. E. LITTLEWOOD AND G. POLYA, *Inequalities*, Cambridge University Press, first edition, (1934).
- [9] A. LAPTEV AND A. V. SOBOLEV, *Hardy inequalities for simply connected planar domains*, Amer. Math. Soc. Transl. Ser. 2, 255: 133–140, (2008).
- [10] J. TIDBLOM, *Improved L^p Hardy inequalities*, PhD thesis, Stockholm University, (2005).