

## KANTOROVICH PROBLEMS UNDER YOUNG TYPE CONSTRAINTS

FLAVIA-CORINA MITROI-SYMEONIDIS AND DANIEL ALEXANDRU ION

*Abstract.* We explain how the Hermite-Hadamard inequality agrees with the primal Monge-Kantorovich problems. We also focus onto a particular case of the dual Kantorovich problem, by considering a version significantly affected by some Young type constraints.

*Mathematics subject classification (2010):* 49N15, 82C70, 28A35, 90B06, 26A51.

*Keywords and phrases:* Cost function, Monge-Kantorovich problem, duality, Kantorovich potential, cost convexity, Young's inequality, Hermite-Hadamard inequality.

### REFERENCES

- [1] Y. BRENIER, U. FRISCH, M. HÉNON, G. LOEPER, S. MATARRESE, R. MOHAYAEE, A. SOBOLEVSKIĬ, *Reconstruction of the early Universe as a convex optimization problem*, Mon. Not. R. Astron. Soc., **346** (2003), 501–524.
- [2] G. BUTTAZZO, *Three optimization problems in mass transportation theory. Nonsmooth mechanics and analysis*, 13–23, Adv. Mech. Math., 12, Springer, New York, 2006.
- [3] F.-C. MITROI, D. A. ION, *Structural results on convexity relative to cost functions*, Aeq. Math., **85**, 1 (2013), 119–130. DOI: 10.1007/s00010-012-0129-y
- [4] F.-C. MITROI, C. P. NICULESCU, *An extension of Young's inequality*, Abs. Appl. Anal., Article ID 162049, doi:10.1155/2011/162049
- [5] C. P. NICULESCU, J. E. PEČARIĆ, *The equivalence of Chebyshev's inequality to the Hermite-Hadamard inequality*, Math. Reports **12** (62), 2 (2010), 145–156.
- [6] C. VILLANI, *Topics in optimal transportation*, Grad. Stud. Math. 58, American Mathematical Society, Providence, RI, 2003.
- [7] C. VILLANI, *Transport optimal de mesure: coup de neuf pour un très vieux problème*, Images des mathématiques, 2004, pp. 114–119.
- [8] C. VILLANI, *Optimal Transport. Old and New*, Series: Grundlehren der mathematischen Wissenschaften, Vol. 338, 2009.
- [9] A. WITKOWSKI, *On Young's inequality*, J. Ineq. Pure and Appl. Math., **7** (2006), Issue 5, article 164.