

## MULTIPLICATIVE SOBOLEV INEQUALITIES OF THE LADYZHENSKAYA TYPE

YONG-KUM CHO

*Abstract.* We present a set of multiplicative Sobolev inequalities that yield less restrictive embedding and Trudinger-type results. The proofs are elementary and deduced only from a multiplicative inequality of Gagliardo-Nirenberg and Hölder's inequality with no recourse to any potential estimates.

*Mathematics subject classification (2010):* 46E35.

*Keywords and phrases:* Multiplicative Sobolev inequality.

### REFERENCES

- [1] H. BRÉZIS AND T. GALLOUET, *Nonlinear Schrödinger evolution equations*, Nonlinear Anal., **4** (1980), 677–681.
- [2] A. P. CALDERÓN, *An inequality for integrals*, Studia Math., **57** (1976), 275–277.
- [3] D. GILBARG AND N. S. TRUDINGER, *Elliptic Partial Differential Equations of Second Order*, Springer-Verlag, Berlin-Heidelberg, 1983.
- [4] O. A. LADYZHENSKAYA, *The Boundary Value Problems of Mathematical Physics*, Applied Math. Sciences **49**, Springer-Verlag, New York (1985)
- [5] T. OZAWA, *On critical cases of Sobolev's inequalities*, J. Funct. Anal., **127** (1995), 259–269.
- [6] R. S. STRICHARTZ, *A note on Trudinger's extension of Sobolev's inequalities*, Indiana Univ. Math. J., **21** (1972), 841–842.
- [7] N. S. TRUDINGER, *On imbedding into Orlicz spaces and some applications*, J. Math. Mech., **17** (1967), 473–484.