

Generalizations of the logarithmic Hardy inequality in critical Sobolev-Lorentz spaces

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Abstract:

In this talk, we are concerned about the Hardy inequality of the logarithmic type. For critical Sobolev spaces, the logarithmic Hardy inequality was proved by Edmunds-Triebel in 1999. We generalize this result to critical Sobolev-Lorentz spaces including the sharpness of the exponents. As another generalization, we consider the logarithmic Hardy inequality in any domain, and we shall establish the inequality for functions in critical Sobolev spaces without the Dirichlet condition, which also includes the original logarithmic Hardy inequality obtained by Edmunds-Triebel. This is a joint work with Prof. Shuji Machihara and Prof. Tohru Ozawa.