

Generalizations of Hardy type inequalities via new Green functions

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This talk deals with Hardy inequality and its famous generalizations, extensions and refinements, i.e. with Hardy-type inequalities. The classical Hardy inequality reads:

$$\int_0^{\infty} \left(\frac{1}{x} \int_0^x f(t) dt \right)^p dx \leq \left(\frac{p}{p-1} \right)^p \int_0^{\infty} f^p(x) dx, \quad p > 1, \quad (1)$$

where f is non negative function such that $f \in L^p(\mathbb{R}_+)$ and $\mathbb{R}_+ = (0, \infty)$. The constant $\left(\frac{p}{p-1} \right)^p$ is sharp. This inequality has been generalized and extended in several directions. In this talk the Hardy inequality is generalized by using new Green functions.