Let $f$ be a real, nonnegative function of the space $L^1[a,b]$, and let, for $y \geq 0$, $m(f,y) = \text{mes}\{x : x \in [a,b], f(x) \geq y\}$. Then the (possibly corrected) inverse of $m(f,y)$, i.e. the function $r(f;a,b;x)$ with $x \in [0,b-a]$, is called the decreasing rearrangement of $f$ on the interval $[a,b]$. The author presents several lemmata and theorems concerning the connection between the decreasing rearrangement of the function $f$ and some best approximation properties in $L_p$-spaces. Special emphasis is given to so-called $n$-regular functions under periodicity assumptions. Most of the underlying ideas can be found in earlier contributions due to the author. A final and detailed version of this paper is announced to appear elsewhere.

Reviewer: G. Meinardus

MSC:

41A17 Inequalities in approximation (Bernstein, Jackson, Nikol’skii-type inequalities)
41A25 Rate of convergence, degree of approximation
42A10 Trigonometric approximation
41A50 Best approximation, Chebyshev systems

Keywords:

extremal properties of functions; rearrangement; $n$-regular functions