The Marcinkiewicz function spaces $M_W$ generated by a decreasing weight $w : \mathbb{R}_+ \rightarrow \mathbb{R}_+$ are the spaces of measurable functions $f$ satisfying $\|f\|_W = \sup_{t>0} \frac{\int_0^t f^*(s)}{W(t)} < \infty$, where $f^*$ is the decreasing rearrangement of $f$ and $W(t) = \int_0^t w$. We also define $M^0_W = \{f \in M_W : \lim_{t \to 0^+} \frac{\int_0^t f^*}{W(t)} = 0\}$. $M^0_W$ is the subspace of all order continuous elements of $M_W$. The dual of $M^0_W$ is the Lorentz space $\Lambda_{1,w}$ with the norm $\|f\|_{1,w} = \int_0^\infty f^*w$.

Theorem: Let $f \in S_{M_W}$ (or $f \in S_{M^0_W}$). Then $f$ is a smooth point in $M_W$ (or $M^0_W$) if and only if there exists a unique $0 < a < \infty$ such that

$$1 = \|f\|_W = \int_0^a \frac{f^*}{W(a)}.$$

Theorem: A function $f \in S_{M_W}$ is an extreme point if and only if $f^* = w$. $M^0_W$ does not have any extreme points. (Received September 11, 2008)