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Deville's Master Lemma and Stone's Discreteness in Renorming Theory

Banach spaces X with an equivalent $\sigma(X, F)$ -lower semicontinuous and locally uniformly rotund norm, for a norming subspace $F \subset X^*$, are those spaces X that admit countably many families of convex and $\sigma(X, F)$ -lower semicontinuous functions $\{\varphi_i^n : X \rightarrow \mathbb{R}^+; i \in I_n\}_{n=1}^\infty$ such that there are open subsets

$$G_i^m \subset \{\varphi_i^n > 0\} \cap \{\varphi_j^n = 0 : j \neq i, j \in I_n\}$$

with $\{G_i^n : i \in I_n, n \in \mathbb{N}\}$ a basis for the norm topology of X .

Keywords: Banach space, local uniform rotundity, slicely-isolatedness, network, convex biorthogonal system.

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