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Erratum to "Some classes of locally convex spaces"

By

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It was proved in [2] that every D_b-space is a quasi-(DF) space. An example to separate these classes was also included. This example is based on theorem 2.3, which is false because in its proof the remark 2.2 is used in a incorrect way. In fact we have

Theorem. *A locally convex space $E[T]$ is quasi-(DF) space if and only if $E[T]$ is a D_b-space.*

Proof. Let $E[T]$ be a quasi-(DF) space and let $\mathscr{A} = \{B_n\}_{n=1}^{\infty}$ be a fundamental sequence of bounded sets in $E[T]$. It is enough to prove that the topology T is finer than the topology $T^{\mathscr{A}}$, the finest locally convex topology on E which agree with T on the element of $\mathscr{A}$. By [1] (12, 3.1), if U is a neighbourhood of the origin in $E[T]$, there exists a sequence $\{U_n\}_{n=0}^{\infty}$ of closed absolutely convex neighbourhood of the origin in $E[T]$, such that,

$$U_0 \cap \left(\bigcap_{n=1}^{\infty} U_n + B_n \right) \subset U .$$

Since $\{\overline{\tfrac{1}{2} U_n + B_n}^{T}\}_{n=1}^{\infty}$ is a quasibornivorous sequence of closed absolutely convex neighbourhood of the origin in $E[T]$, it follows that

$$V = \bigcap_{n=1}^{\infty} \overline{\tfrac{1}{2} U_n + B_n}^{T}$$

is a neighbourhood of the origin in $E[T]$. It is now obvious that $V \cap U_0 \subset U$. Therefore U is a neighbourhood of the origin in $E[T]$. Q.E.D.

References

[1] H. Jarchow, Locally Convex Spaces. Stuttgart 1981.
[2] J. Mazon, Some classes of locally convex spaces. Arch. Math. **38**, 131–137 (1982).

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