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ON SOME SPACES OF ENTIRE FUNCTIONS DEFINED ON INFINITE DIMENSIONAL SPACES

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Let E be a quasi-complete dual nuclear complex locally convex space; we prove that both spaces $\mathscr{H}_{Nb}(E)$ and $\mathscr{H}_{SNb}(E)$ of entire functions of nuclear type on E introduced by Matos and Matos-Nachbin coincide with the space $\mathscr{H}_S(E)$ of the Silva holomorphic functions. As a consequence, well known results of Boland on convolution equations in $\mathscr{H}(E)$ can be obtained as particular cases of results in Matos's Doctoral Dissertation.

Preface. In order to study various problems, authors were led to introduce various adequate spaces of holomorphic functions on locally convex spaces (l.c.s.). For the study of convolution equations and following Gupta [6, 7], Matos introduced in [11, 12] the concept of entire function of nuclear bounded type on any complex l.c.s. E (we denote their space by $\mathscr{H}_{Nb}(E)$). Latter Matos-Nachbin introduced in [13] the concept of Silva entire function of nuclear bounded type (we denote their space by $\mathscr{H}_{SNb}(E)$). On the other side Boland [1, 2] was the first to obtain results in the whole space $\mathscr{H}(E)$ of the entire functions (G-analytic and continuous) but under the assumption that E is a quasi-complete dual nuclear l.c.s.

The aim of this paper is to prove (Th. 3.6 and 3.9) that when E is a quasi-complete dual nuclear l.c.s. both spaces $\mathscr{H}_{Nb}(E)$ and $\mathscr{H}_{SNb}(E)$ coincide with the space $\mathscr{H}_S(E)$ of the Silva holomorphic functions on E. Since in this case $\mathscr{H}(E)$ is dense in $\mathscr{H}_S(E)$ with induced topology and $\mathscr{H}(E)$ coincides with $\mathscr{H}_S(E)$ if E is a strong dual of a nuclear Fréchet space it follows that Boland's results can now be interpreted as consequences of Matos's results, thus providing a clarification and unification of the theory.

First we fix the notations (part 1) and recall definitions (part 2). In part 3 we prove our result above and in part 4 we apply it to interprete Boland's results in term of Matos' results.

1. Notations and terminology. We use the classical notations of the theory of infinite dimensional holomorphic functions [14]. All the vector spaces considered here are complex.

If E is a locally convex space (l.c.s. for short), E' denotes its