# On commutators acting on some Fréchet spaces over non-Archimedean fields

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Recall that a non-Archimedean field means a non-trivially valued field $\mathbb{K}$ endowed with complete metric generated by the valuation $|\cdot| : \mathbb{K} \to [0, \infty)$ such that $|\alpha + \beta| \leq \max\{|\alpha|, |\beta|\}$ for all $\alpha, \beta \in \mathbb{K}$. The talk deals with commutators on the generalized power series spaces $D_f(a, r)$ over non-Archimedean fields, which provide the most known and important examples of non-Archimedean nuclear Fréchet spaces. Recall also that a *commutator* of a pair of operators $A$ and $B$ on a locally convex space $E$ is defined by $[A, B] := AB - BA$. An operator $T$ on $E$ is said to be a commutator if $T$ can be expressed in the form $T = [A, B]$ for some operators $A$ and $B$ on $E$. We show (among others) the following

**Theorem:** *If* $r \in \{0, \infty\}$ *and* $\sup_n [a_{2n}/a_n] < \infty$ *or* $r \in (-\infty, 0) \cup (0, \infty)$, $\lim_n [a_{2n}/a_n] = 1$ *and* $f$ *is rapidly increasing, then every operator on* $D_f(a, r)$ *is a commutator. On the other hand, if* $\lim_n [a_{n+1}/a_n] = \infty$, *the identity operator on* $D_f(a, r)$ *is not a commutator.*

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