

Surjectivity of the asymptotic Borel map in Carleman ultraholomorphic classes defined by weight sequences with shifted moments

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Javier Jiménez-Garrido

University of Cantabria

We put forward a new condition for weight sequences, much weaker than the classical condition of derivation closedness included in the definition of regular weight sequences. More precisely, a weight sequence $\mathbf{M} = (M_p)_{p \geq 0}$ has shifted moments, (sm) for short, if

$$\exists C_0 > 0, H > 1: \forall p \in \mathbb{N}_0, \log(m_{p+1}/m_p) \leq C_0 H^{p+1}, \quad (m_p := M_{p+1}/M_p).$$

We will show that under this condition it is possible to adapt the Borel- and truncated Laplace-transforms in order to obtain improved versions of the Borel-Ritt theorem about the surjectivity of the asymptotic Borel mapping in Roumieu classes of functions with \mathbf{M} -uniform asymptotic expansion on an unbounded sector of the Riemann surface of the logarithm.

Regarding Beurling classes, we are able to slightly improve a classical result of J. Schmets and M. Valdivia and reprove a result of A. Debrouwere, both under derivation closedness. Our new condition also allows us to obtain surjectivity results for Beurling classes in suitably small sectors, but the technique is now adapted from a classical procedure already appearing in the work of V. Thilliez, in its turn inspired by that of J. Chaumat and A.-M. Chollet.

This is joint work with I. Miguel-Cantero (Univ. of Valladolid), J. Sanz (Univ. of Valladolid) and G. Schindl (Univ. of Vienna, Austria).
