

Complex Analysis Seminar, Winter Semester 2023-2024.

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Title:

An introduction to the $\mathcal{N}(p, q, s)$ spaces on the unit ball of \mathbb{C}^n .

Abstract: In this talk we will talk about some basic facts regarding the $\mathcal{N}(p, q, s)$ -type spaces on the unit ball of \mathbb{C}^n . The $\mathcal{N}(p, q, s)$ spaces are defined as follows: For $p \geq 1, q > 0, s > 0$:

$$f \in \mathcal{N}(p, q, s) \iff \sup_{a \in \mathbb{B}} \int_{\mathbb{B}} |f(z)|^p (1 - |z|^2)^q (1 - |\Phi_a(z)|^2)^{ns} d\lambda(z) < \infty,$$

where $\Phi_a(z) \in \text{Aut}(\mathbb{B})$ (involutive automorphisms of the unit ball e.g. [1]) and $d\lambda(z) = (1 - |z|^2)^{-n-1} dV(z)$, where $dV(z)$ denotes the usual normalized volume measure on the ball.

We will present some basic elements of the theory of the above mentioned spaces, their relation with other well studied function spaces on the ball, such as Bergman, Bloch, Q_p spaces, and also provide some derivative characterizations and derivative free characterizations. Lastly, we will give some information about the problems that have been solved for $\mathcal{N}(p, q, s)$ spaces and also which problems are still open.

References

- [1] B.Hu, S.Li, ' $\mathcal{N}(p, q, s)$ -Type spaces on the unit ball of \mathbb{C}^n ', arXiv:1609.00957v2, 2017.
- [2] K.Zhu, '*Spaces of Holomorphic functions in the unit ball*', Springer-Verlag, New York, 2005.