

Function spaces on the disk and the plane: Model and de Branges spaces, recent results, extensions, and applications

Marco M. Peloso and William T. Ross — Cortona, May 7-19, 2023

Function spaces on the disk (William Ross)

- Lebesgue spaces on the circle, Fourier series
- The conjugation problem, Riesz projection
- Measures on the circle, Poisson integral of a measure
- Hardy spaces
- Factorization theorem (inner-outer)
- The shift on the Hardy space
- Toeplitz and Hankel operators
- Beurling's theorem
- The adjoint of the shift
- Model spaces, pseudocontinuations, Clark theory
- de Branges—Rovnyak spaces and models for contractions

Spaces of entire functions, their operators, and applications (Marco Peloso)

- Basic facts on entire functions: Infinite products, zeros and growth, factorization, finite order
- Functions of exponential type, the Bernstein spaces
- Sampling and Carleson measures, and duality: case $1 < p < \infty$
- BMO space and the dual of B^1 , case $0 < p < 1$
- Hermite Biehler functions and de Branges spaces
- Relation with the spectral theory of canonical systems
- The generalized Fourier transform
- p - de Branges spaces, the dual of $H^1(E)$
- Extensions to several complex variables, open problems

Bibliography

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- L. de Branges, Hilbert spaces of entire functions, Prentice-Hall 1968
- Garcia, S. R., Mashreghi, J., & Ross, W.T., Introduction to model spaces and their operators, Cambridge Studies in Advanced Mathematics, Cambridge University Press, 2016
- R. Romanov, Canonical systems and de Branges spaces, preprint arXiv:1408.6022, 2014
- Garcia, S. R., Mashreghi, J., Ross, W. T., Operator Theory by Example, Oxford, 2023.

Notes for the courses

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