

Spectral theory of rank one dynamical systems

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PROGRAM OF THE COURSE

Part I: Riesz products via harmonic analysis.

In this part we discuss different classes of probability measures on \mathbb{R} constructed with the help of Riesz products, including Salem question.

- a) Zygmund singularity criterion.
- b) Theorem on mutual singularity due to Peyrière.

Part II: Generalized Riesz products as spectral types of dynamical systems (\mathbb{Z} -actions).

- 1) Ledrappier example (classical Riesz products).
- 2) Spectral type of the Morse substitution.
- 3) On the spectral type of substitutions with (multi-dimensional Riesz products) with applications to interval exchange transformations.
- 4) Host–Parreau–Méla theorem.
- 5) Spectral type of a rank one transformation via Bourgain technique.
- 6) Bourgain singularity criterion.
- 7) Conditions for existence of the Lebesgue component.
- 8) Bourgain and Klemes–Reinhold theorems on spectral type of a rank one transformation.

Part III: Generalized Riesz products as spectral types of dynamical systems (countable group actions).

- 9) Examples due to Ismagilov.
- 10) Helson–Parry and Guenais examples.

Course will be held at IUM MCCME, starting from February 27, 2012