

# The Beurling-Roumieu space $\mathcal{D}^{(\mathfrak{M} \times \mathfrak{M}')}(\Omega \times \Omega')$

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## Abstract

In [10], we started the study of the countable intersections of non quasi-analytic classes of ultradifferentiable functions. In particular the Beurling and the Roumieu intersections coincide as vector spaces. We then studied the countable Beurling-Beurling intersections in [11] and [12], up to tensor product characterizations and kernel theorems. In this paper, we present a study of the countable Beurling-Roumieu intersections.

**Mathematics Subject Classification:** 46A11, 46A32, 46E10, 46F05.

**Key words:** ultradifferentiable functions, Beurling classes, Roumieu classes, tensor product, kernel theorem.

## 1 Introduction

In [10], we introduced countable intersections of non quasi-analytic classes of ultradifferentiable functions of Beurling and of Roumieu type. In particular, we proved that as vector spaces, they coincide but are in general new spaces, developed some general properties (about denseness, for example) and gave a condition under which these spaces are nuclear.

In [11] and [12], we introduced the countable Beurling-Beurling intersections

$$\mathcal{E}_{(\mathfrak{M} \times \mathfrak{M}')}(\Omega \times \Omega'), \mathcal{D}_{(\mathfrak{M} \times \mathfrak{M}')}(\Omega \times \Omega') \text{ and } \mathcal{D}_{(\mathfrak{M} \times \mathfrak{M}')}(\mathcal{K} \times \mathcal{K}'),$$

of non quasi-analytic classes of ultradifferentiable functions and presented a study of their properties up to tensor product characterizations and kernel theorems.

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