Schwartz Space and Tempered Distributions

January 14, 2020

在本文中,

$$\mathbb{Z}_+ := \{0, 1, 2, \ldots\}.$$

对$\forall \alpha := (\alpha_1, \ldots, \alpha_n) \in \mathbb{Z}_+^n$,

$$|\alpha| := \sum_{k=1}^n |\alpha_k|.$$

对$\forall \alpha := (\alpha_1, \ldots, \alpha_n) \in \mathbb{Z}_+^n$ 和$\forall x := (x_1, \ldots, x_n) \in \mathbb{R}^n$,

$$x^\alpha := \prod_{k=1}^n x_k^{\alpha_k}.$$

0.1   Space of Tempered Distributions Modulo Polynomials

本section 的内容来自[1, 1.1.1]

首先介绍多项式空间$\mathcal{P}(\mathbb{R}^n)$.

$$\mathcal{P}(\mathbb{R}^n) := \left\{ \sum_{\alpha \in \mathbb{Z}_+^n, |\alpha| \leq m} c_\alpha x^\alpha : m \in \mathbb{Z}_+, \text{ for any } \alpha \in \mathbb{Z}_+^n \text{ and } |\alpha| \leq m, c_\alpha \in \mathbb{C} \right\}.$$

References

[1] L. Grafakos, Modern Fourier Analysis, Third edition, Graduate Texts in Mathematics, 249, Springer, New York, 2014.