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On Local Hörmander-Beurling Spaces

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**Abstract:** In this paper we aim to extend a result of Hörmander's, that  $\mathcal{B}_{p,k}^{loc}(\Omega) \subset \mathcal{C}^m(\Omega)$  if  $\frac{(1+|\cdot|)^m}{k} \in L_{p'}(\Omega)$ , to the setting of vector valued local Hörmander-Beurling spaces, as well as to show that the space  $\bigcap_{j=1}^{\infty} \mathcal{B}_{p_j, k_j}^{loc}(\Omega, E)$  ( $1 \leq p_j \leq \infty$ ,  $k_j = e^{j|\cdot|}$ ,  $j=1,2,\dots$ ) is topologically isomorphic to  $\mathcal{E}'(\Omega, E)$ . Moreover, it is well known that the union of Sobolev spaces  $\mathcal{H}_s^{loc}(\Omega) (= \mathcal{B}_{2,(1+|\cdot|)^2}^{s/2, loc}(\Omega))$  coincides with the space  $\mathcal{D}'^{prime, F}(\Omega)$  of finite order distributions on  $\Omega$ . We show that this is also verified in the context of vector valued Beurling ultradistributions.

**Key Words:** Hörmander space, Hörmander-Beurling space, Beurling ultradistributions, local space, Fourier-Laplace transform

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