Le Hai Khoi (lhkhoi@ntu.edu.sg), Division of Mathematical Sciences, School of Physical and Mathematical Sciences, Nanyang Technological University (NTU), 637371 Singapore, ***Representing systems of exponentials in $A^{-\infty}(\Omega)$.***

ABSTRACT. Let Ω be a bounded convex domain in $\mathbb{C}^n$ and $d(z) := \inf_{\zeta\in\partial\Omega} |z-\zeta|$, $z \in \Omega$. The space $A^{-\infty}(\Omega)$ of holomorphic functions in Ω with polynomial growth near the boundary $\partial\Omega$, equipped with its natural inductive limit topology, is defined as:

$$A^{-\infty}(\Omega) := \left\{ f \in \mathcal{O}(\Omega) : \exists\, p > 0, \quad \sup_{z\in\Omega} |f(z)|\ [d(z)]^p < \infty \right\}.$$

This function algebra, as is well-known, arises from Schwartz theory of distributions.

We show an algorithm of explicit construction of vectors $(\lambda_k) \subset \mathbb{C}^n$ for which the system of exponentials $\left(e^{\langle \lambda_k, z\rangle}\right)_{k=1}^{\infty}$ is a representing system for $A^{-\infty}(\Omega)$; that is any function $f \in A^{-\infty}(\Omega)$ can be represented in a form of Dirichlet series

$$f(z) = \sum_{k=1}^{\infty} c_k e^{\langle \lambda_k, z\rangle},$$

that converges for the topology of $A^{-\infty}(\Omega)$. For getting this representation we use the Fourier-Borel-Laplace transformation to describe the dual space to $A^{-\infty}(\Omega)$ as a space of entire functions in $\mathbb{C}^n$ with certain growth, and construct a so-called discrete sufficient set for the latter space. The applications to convolution equations in $A^{-\infty}$ are also considered.

The results are based on joint works with A.V. Abanin and R. Ishimura.