1176-43-310 **Fulton Gonzalez** (fulton.gonzalez@tufts.edu), **Jue Wang*** (jue.wang@tufts.edu) and **Tomoyuki Kakehi** (kakehi@math.tsukuba.ac.jp). *Surjectivity of Convolution Operators on Noncompact Symmetric Spaces.*

In 1960, Ehrenpreis defined the *slow decrease* condition for functions on $\mathbb{C}^n$, and proved that for $\mu \in \mathcal{E}'(\mathbb{R}^n)$, the convolution operator $C_\mu : T \mapsto T * \mu$ is surjective on $\mathcal{E}(\mathbb{R}^n)$ as well as on $\mathcal{D}'(\mathbb{R}^n)$, if and only if the Fourier transform of μ is of slow decrease. This generalizes the classical Malgrange-Ehrenpreis Theorem.

In this talk, we extend Ehrenpreis' result to noncompact symmetric spaces $X = G/K$. For each $\mu \in \mathcal{E}'_K(X)$ (the subscript K means the K-invariance), let $c_\mu : T \mapsto T * \mu$ be the right convolution operator on X. We establish the equivalence of the following:

- The spherical Fourier transform $\tilde{\mu}$ is slowly decreasing.
- $c_\mu : \mathcal{E}_K(X) \to \mathcal{E}_K(X)$ is surjective;
- $c_\mu : \mathcal{D}'_K(X) \to \mathcal{D}'_K(X)$ is surjective;
- $c_\mu : \mathcal{E}(X) \to \mathcal{E}(X)$ is surjective;
- c_μ has a fundamental solution $S \in \mathcal{D}'(X)$, i.e. $S * \mu = \delta_o$.

As a corollary, any nonzero invariant differential operator always has a fundamental solution and is surjective on $\mathcal{E}(X)$, which are two classical results proved by Helgason in 1964 and 1973, respectively. (Received January 25, 2022)