

The subelliptic heat kernel and its asymptotics on model spaces

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Abstract: We study the heat kernels of the sub-Laplacian on both the CR sphere \mathbb{S}^{2n+1} and the CR hyperbolic space \mathbb{H}^{2n+1} . We work in cylindrical coordinates that reflect the symmetries coming from the fibration $\mathbb{S}^{2n+1} \rightarrow \mathbb{C}\mathbb{P}^n$ and $\mathbb{H}^{2n+1} \rightarrow \mathbb{C}\mathbb{H}^n$, and derive explicit and geometrically meaningful formulas for the subelliptic heat kernels. As by-products we obtain the small-time asymptotics of the heat kernels, and also get explicit formulas for the sub-Riemannian distance.