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Lu Qi-keng's problem in Cartan–Hartogs domains

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The Lu Qi-keng problem for a domain $U \subset \mathbb{C}^n$ consists in deciding whether the Bergman kernel $K_U(z, w)$ of this domain may vanish at some points of $U \times U$. Let Ω be an irreducible bounded circled homogeneous domain and $N(z, t)$ its generic norm. For $\mu > 0$ and m a positive integer, let

$$\widehat{\Omega}_m(\mu) = \{t(z, Z) \in \Omega \times \mathbb{C}^m, \|Z\|^2 < Nt(z, z)^\mu\}.$$

The domain $\widehat{\Omega}_m(\mu)$ is called a Cartan–Hartogs domain. In this talk, we give a complete solution of the Lu-Qikeng problem for the Cartan-Hartogs domains when the dimension of the base Ω is at most 4. This work was supervised by professor Guy Roos (Saint-Petersburg).