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The Loewner-Nirenberg Problem in Cones

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Abstract

We study asymptotic behaviors of solutions to the Loewner-Nirenberg problem in finite cones and establish optimal asymptotic expansions in terms of the corresponding solutions in infinite cones. The spherical domains over which cones are formed are allowed to have singularities. An elliptic operator on such spherical domains with coefficients singular on boundary play an important role. Due to the singularity of the spherical domains, extra cares are needed for the study of the global regularity of the eigenfunctions and solutions of the associated Dirichlet problem.