GLOBAL NEWLANDER-NIRENBERG PROBLEM ON DOMAINS WITH FINITE SMOOTH BOUNDARY IN A COMPLEX MANIFOLD

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Abstract: Let M be a relatively compact C^2 domain in a complex manifold X of dimension n. Assume that $H^{(0,1)}_{\overline{\partial}}(M,\Theta) = 0$ where Θ is the holomorphic tangent bundle of M. Suppose that the Levi-form of the boundary of M has at least 3 negative eigenvalues or at least $n-1$ positive eigenvalues pointwise. We will first construct a homotopy formula for Θ-valued $(0,1)$-forms on $\overline{M}$. We then apply a modified Nash-Moser iteration scheme to show that when a formally integrable and smooth almost complex structure on $\overline{M}$ is sufficiently close to the complex structure on $\overline{M}$, there is a smooth diffeomorphism F from $\overline{M}$ into X transforming the almost complex structure into the complex structure on $F(M)$. We will also present results when the formally integral almost complex structure and the boundary of M are finite smooth. This is joint work with Ziming Shi.