Global Newlander-Nirenberg theorem for domains with C^2 boundary

Xianghong Gong

University of Wisconsin-Madison

We consider two natural generalizations of the Newlander-Nirenberg theorem under the presence of a C^2 strictly pseudoconvex boundary. When a given formally integrable complex structure X is defined on the closure of a bounded strictly pseudoconvex domain D in $\mathbf{C}^n$ with C^2 boundary, we show the existence of global holomorphic coordinate systems defined on $\overline{D}$ that transform X into the standard complex structure provided that X is sufficiently close to the standard complex structure. Moreover, we show that such closeness is stable under a small C^2 perturbation of the boundary of D. As a consequence, when a given formally integrable complex structure is defined on a one-sided neighborhood of some point in a C^2 real hypersurface M in $\mathbf{C}^n$, we prove the existence of local one-sided holomorphic coordinate systems provided that M is strictly pseudoconvex with respect to the given complex structure. We also obtain results when the structures are finite smooth. This is joint work with Chun Gan.