THE NON-LINEAR COUSIN PROBLEM FOR J-HOLOMORPHIC MAPS

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Let $\Omega_1, \Omega_2 \subset \mathbb{C}$ be two smooth, bounded and simply connected domains with non-empty intersection. We say that they form a good pair if $\overline{\Omega_2 \setminus \Omega_1} \cap \overline{\Omega_1 \setminus \Omega_2} = \emptyset$. Let $u_1 \colon \Omega_j \to \mathbb{C}^n$ and $u_2 \colon \Omega_2 \to \mathbb{C}^n$ be two holomorphic maps. Provided that their images are $\mathcal{C}^0$-close on $\Omega_1 \cap \Omega_2$ we seek a map $u \colon \Omega_1 \cup \Omega_2 \to \mathbb{C}^n$ that is holomorphic and approximates the connected union of $u_1(\Omega_1)$ and $u_2(\Omega_2)$. Such an inquiry is often named the (linear) Cousin problem and can be solved easily by applying a singular integral operator arising from the Caucy integral formula. In my talk I will present a non-linear analogue of this construction valid for almost complex manifolds. That is, we will provide gluing techniques for pseudoholomorphic maps defined on a good pair of domains.