Removable Singularities For The Von Karman Equations

Let $\Omega \subset \mathbf{R}^2$ be a bounnded domain. The Von-Karman equations in Ω is the following fourth order system:

$$\begin{aligned} \Delta^2 f &= -[w, w] \\ \Delta^2 w &= \lambda[F, w] + [f, w] \end{aligned}$$

where Δ^2 represents the iterated Laplace operator, $\lambda \in \mathbf{R}$, $F \in C^{2+\alpha}(\Omega)$, and $[f, w]$ is the stands for the Monge-Ampere expression

$$[f, w] = f_{11} w_{22} + w_{11} f_{22} - 2(f_{12} w_{12}).$$

The following concerning removable singularities for the Von-Karman equations is estsblished:

Let Ω be the unit disk and suppose $f, w \in C^4(\Omega \backslash \{0\})$. Suppose also that f, w satisfy the Von-Karman equations in $\Omega \backslash \{0\}$.In addition, suppose that

$$f, \Delta f, w, \Delta w = o\left(\log \frac{1}{r}\right) \quad \textit{as } r \to 0.$$

Then f,w can be defined at the origin so that f,w$\in C^4(\Omega)$ and also satisfy the Von-Karman equations in Ω. In many respects, this is a best possible result.

This is joint work with L. B. Di Fiori.