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The Monge-Ampére Equation and Complex Degenerate Surfaces

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We discuss the Dirichlet problem for the complex Monge-Ampére equation on a compact Stein manifold with boundary following the methods developed by Caffarelli, Nirenberg and Spruck for strictly pseudo-convex domains in $\mathbb{C}^n$. We introduce a new Hodge theory for a class of compactifications of open complex analytic surfaces. The model for the compactification is the inverse image of the ordinary structure of $\mathbb{C}^2$ by a double covering ramified along a real plane.