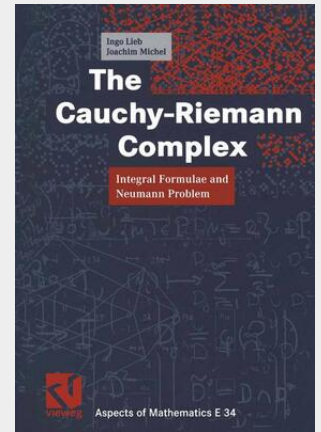


The Cauchy-Riemann Complex

Integral Formulae and Neumann Problem

This book presents complex analysis of several variables from the point of view of the Cauchy-Riemann equations and integral representations. A more detailed description of our methods and main results can be found in the introduction. Here we only make some remarks on our aims and on the required background knowledge. Integral representation methods serve a twofold purpose: 1° they yield regularity results not easily obtained by other methods and 2°, along the way, they lead to a fairly simple development of parts of the classical theory of several complex variables. We try to reach both aims. Thus, the first three to four chapters, if complemented by an elementary chapter on holomorphic functions, can be used by a lecturer as an introductory course to complex analysis. They contain standard applications of the Bochner-Martinelli-Koppelman integral representation, a complete presentation of Cauchy-Fantappie forms giving also the numerical constants of the theory, and a direct study of the Cauchy-Riemann complex on strictly pseudoconvex domains leading, among other things, to a rather elementary solution of Levi's problem in complex number space \mathbb{C}^n . Chapter IV carries the theory from domains in \mathbb{C}^n to strictly pseudoconvex subdomains of arbitrary - not necessarily Stein - manifolds. We develop this theory taking as a model classical Hodge theory on compact Riemannian manifolds; the relation between a parametrix for the real Laplacian and the generalised Bochner-Martinelli-Koppelman formula is crucial for the success of the method.

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