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Comparison with the Auscher–Stahlhut interval -- Chapter. 16. Basic properties of weak solutions -- Chapter. 17. Existence in Hp Dirichlet and Regularity problems -- Chapter. 18. Existence in the Dirichlet problems with data -- Chapter. 19. Existence in Dirichlet problems with fractional regularity data -- Chapter. 20. Single layer operators for L and estimates for L-1 -- Chapter. 21. Uniqueness in regularity and Dirichlet problems -- Chapter. 22. The Neumann problem -- Appendix A. Non-tangential maximal functions and traces -- Appendix B. The Lp-realization of a sectorial operator in L2 -- References -- Index.

Sommario/riassunto

In this monograph, for elliptic systems with block structure in the upper half-space and t-independent coefficients, the authors settle the study of boundary value problems by proving compatible well-posedness of Dirichlet, regularity and Neumann problems in optimal ranges of exponents. Prior to this work, only the two-dimensional situation was fully understood. In higher dimensions, partial results for existence in smaller ranges of exponents and for a subclass of such systems had been established. The presented uniqueness results are completely new, and the authors also elucidate optimal ranges for problems with fractional regularity data. The first part of the monograph, which can be read independently, provides optimal ranges of exponents for functional calculus and adapted Hardy spaces for the associated boundary operator. Methods use and improve, with new results, all the machinery developed over the last two decades to study such problems: the Kato square root estimates and Riesz transforms, Hardy spaces associated to operators, off-diagonal estimates, non-tangential estimates and square functions, and abstract layer potentials to replace fundamental solutions in the absence of local regularity of solutions.