On Levi functions

W.L. Wendland

Fundamental solutions to elliptic partial differential operators are explicitly known only in particular cases whereas Levi functions can always be constructed.

In this lecture, the simple case of a second order operator with variable coeffients will be considered and with Levi Functions a system of domain–boundary integral equations for the Dirichlet problem will be obtained. The mapping properties of the corresponding operators will provide the opportunity of employing efficient solution techniques.

E.E. Levi: Sulle equazioni lineari totalmente ellittiche alle derivati parziali. Rend. Circ. Math. Palermo **24** (1907) 275-317.

D. Hilbert: Grundzüge einer allgemeinen Theorie der linearen Integralgleichungen. Teubner, Leipzig 1912.

A. Pomp: The Boundary–Domain Integral Method for Elliptic Systems. Springer–Lecture Notes 1683, 1998.

G.C. Hsiao, W.L. Wendland: Boundary Integral Equations, Springer–Verlag Berlin 2008.