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Spectral theory of linear differential operators and comparison algebras by H. O. Cordes. London Mathematical Society Lecture Notes Series, vol. 76, Cambridge University Press, Cambridge, New York, Melbourne, 1987, ix + 342 pp., $29.95. ISBN 0-521-28443-0

Since the introduction of pseudodifferential operators (psdo) in the foundational papers by J. Bokobza and A. Unterberger [**BU**] and by J. J. Kohn and L. Nirenberg [**KN**] more than 20 years ago, the psdo proved to be a powerful tool in the analysis of partial differential operators (pdo) on compact smooth manifolds and euclidean spaces.

Recently much of attention has been shifted to pdo on noncompact manifolds (cf. [**CGT**, **D3**, **M**, **P**, **R**, **S**]). It is conspicuous however how little the psdo have been used in this context (cf. [**E**]), possibly because a necessary global symbolic calculus is still in its development. The Cordes book presents a principal calculus of such sort in a C^*-algebras framework.

One of two historical sources of psdo was the theory of boundary value problems for elliptic equations (another was quantization). It was concerned with classical potential representations of their solutions. The potential densities satisfy singular integral equations on the boundary, and a general technique (proposed by G. Giraux in 1934) was a reduction to regular Fredholm integral equations. In 1936 S. G. Mikhlin found a key for such regularization, introducing the (principal) symbol of singular integral operators (sio). Actually he worked with sio on the plane, but his symbol construction was immediately extended by G. Giraux to any euclidean space. The construction was based on a rather heavy decomposition of the sio into multiple power series $\Lambda_j = (-\Delta)^{1/2}\partial/\partial x_j$ of Riesz operators. In the 1950s A. Calderón and A. Zygmund discovered a much more flexible