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Spectral Invariance of Non-Smooth Pseudodifferential Operators

In the last decades the theory of pseudodifferential operators was established as a powerful tool in operator theory and the theory of PDEs. By means of the mapping properties of pseudodifferential operators we can show regularity results of $Pu = f$ on a big class of different function spaces, if the inverse of the pseudodifferential operator P is a pseudodifferential operator again. There have been several observations in the smooth case, yet. Results of R. Beals and J. Ueberberg allow us to directly obtain the following statement for smooth pseudodifferential operators P , whose symbols are in the Hörmander class $S_{\rho,\delta}^m(\mathbb{R}^n \times \mathbb{R}^n)$: The spectrum of P , considered as a map between the two Bessel potential spaces $H_2^{s+m}(\mathbb{R}^n)$ and $H_2^s(\mathbb{R}^n)$ is independent of $s \in \mathbb{R}$. This result can be extended to various other function spaces.

In applications also non-smooth pseudodifferential operators occur. The goal of this talk is to verify similar results for non-smooth pseudodifferential operators of the symbol-class $C^\tau S_{1,0}^0(\mathbb{R}^n \times \mathbb{R}^n; N)$.

The talk is based on a joint work with H. Abels.