

Mellin pseudodifferential operators with non-regular symbols and their algebras

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Abstract

Mellin pseudodifferential operators with bounded measurable symbols whose values belong to some subclasses of Fourier multipliers are studied on Lebesgue spaces. Criteria of the boundedness and compactness of these operators are established. The compactness of commutators and semicommutators of Mellin pseudodifferential operators is obtained for a subclass of non-regular symbols of limiting smoothness. Banach algebras of Mellin pseudodifferential operators with mentioned classes of non-regular symbols are investigated, and the corresponding symbol calculus is constructed. Applications of such Mellin pseudodifferential operators and their algebras are considered.