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The geometry of the calculus of Fourier integral operators

Abstract: Let be a Fourier Integral Operator and let and denote the algebras of pseudodifferential operators on X and Y. A natural object to consider is the bimodule , which carries the geometric information about the original operator. Since the algebras of pseudodifferential operators admit microlocal description via symbol calculus, the same kind of study can be applied to the bimodule . We will construct the microlocal bimodules associated to this situation and explain the kind of geometry involved in their study.As examples of applications we'll give homological interpretation of the composition of Fourier Integral Operators and of their traces. An important case where this kind of operators appear is the construction of Guillemin and Sternberg of Fourier Integral projections associated to coisotropic submanifolds of cotangent bundle of a closed manifold. We will apply the above methods to give a formula for the index of the operators of this type.

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