TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

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Fourier Integral Operators: an overview, Part II

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Abstract: The theory of Fourier Integral Operators, developed as such in the late 1960's (Hörmander, Duistermaat-Hörmander), is a very important tool in the analysis of non-elliptic partial differential equations, especially those of hyperbolic type such as the wave equation. In the latter context, FIO's may be viewed as an operator version of geometric optics. Among their features is an intertwining of geometry and analysis that led to, and continues to yield, many important results by many authors in geometric analysis and inverse problems. Within analysis of PDE's, together with the theory of pseudodifferential operators (Kohn-Nirenberg) they allowed for very refined analysis of singularities of solutions of (pseudo-)differential equations and of solvability.

I plan to give, in two talks, an overview of the theory directed at graduate students (no background in PDE's, but some in Real Analysis), including some aspects of pseudodifferential operators, as well as the auxiliary but very useful concept of wave front set (a generalization of the notion of set of singularities). The first talk will focus on the theory, the second perhams some more on theory, but mainly on some applications.