1116-35-2816 **Peter A Caday*** (pac5@rice.edu). *Computing Fourier Integral Operators with Caustics.*

Fourier integral operators (FIOs) make appearances in PDEs, integral geometry, and are a common tool in studying inverse problems. With these applications in mind, it would be useful to have an algorithm for computing a given FIO, given a description of its canonical relation and principal symbol. Most work in numerical computation of FIOs focuses on operators associated with canonical graphs. These encompass many FIOs of practical interest and have local integral representations which are particularly amenable to efficient numerical computation. A complication arises when the canonical transformation has caustics, and the local representation breaks down.

In this talk, I will present a numerical implementation of an algorithm of de Hoop, Uhlmann, Vasy, and Wendt which uses suitable coordinate changes and microlocal cutoffs to reduce any FIO associated with a canonical graph to a sum of local representations. The local representations are then approximated modulo lower-order terms with a technique inspired by wave packets. Many pictures will be included, illustrating the application of the new algorithm to various FIOs. (Received September 22, 2015)