DIFFERENTIAL GEOMETRY/PDE/IP SEMINAR

WEDNESDAY, OCTOBER 29, 2008
PADELFORD C-36
3:45–5PM

The Weighted Doppler Transform

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The Doppler transform, I, of a vector field f gives, essentially, its integrals along a family of curves. If a weight function is added to these integrals, then we have the weighted Doppler transform. While the Doppler transform itself is only injective up to potential fields, it was discovered by Bukhgeim and Kazantsev that when the family of curves consists of straight lines, for weights originating from non-zero attenuations the weighted Doppler transform is injective. We extend this result to more general families of curves and weights by applying microlocal techniques in two ways. First we show that, under certain conditions, a system involving the normal operator $N = I^*I$ is an elliptic system of pseudodifferential operators and so there is a parametrix. Second we apply analytic microlocal analysis to show that when the curves and weight are analytic I is actually injective. Together with a stability estimate for the inversion of N this shows that I is injective for generic families of curves and weights.

For more information about this seminar, visit the DG/PDE Seminar Web page (from the Math Department home page, `www.math.washington.edu`, follow the link **Seminars, Colloquia, and Conferences**).

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