

# Comments on the class of paired Lagrangian distributions

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## **Abstract:**

There are three different approaches to the class  $I(X, \Lambda_0, \Lambda_1)$  of paired Lagrangian distributions on  $X$ : 1) conjugating into a normal form by an elliptic Fourier integral operator and then discussing this normal form (R. Melrose, G. Uhlmann, V. Guillemin), 2) stability of  $B_{2,\infty}^s$  regularity under the application of first-order pseudodifferential operators characteristic with respect to the pair  $(\Lambda_0, \Lambda_1)$  (R. Melrose, M. Joshi), and 3) using a parametrisation via multi-phase functions (G. Mendoza)

In this talk, I shall extend Mendoza's approach to more general multi-phase functions. Among others, this has the advantage of making compositions within the class of paired Lagrangian distributions easier to handle. I shall further discuss geometric properties of the class  $I(X, \Lambda_0, \Lambda_1)$  from this new perspective, including the principal symbol map  $(\sigma_{\Lambda_0}, \sigma_{\Lambda_1})$ , and indicate various interesting subclasses. If time permits, I will also give applications to some problems in the theory of hyperbolic differential operators.

This is joint work with my current Ph.D. student Thang Nhu Nguyen.