

October 10, 2006

Abstract

In classical distribution theory the pullback of a general distribution by a C^∞ function is well-defined, whenever the intersection of the normal bundle of the C^∞ function with the wavefront set of the distribution is empty. However, the Colombeau algebra of generalized functions allows the definition of a pullback by any c-bounded generalized function. It has already been shown in earlier work that in the case of multiplications of Colombeau functions (which is the special case of a C^∞ pullback of Colombeau functions), the generalized wave front set of the product has the same inclusion relation as in the distributional case, if the factors have wavefront sets in favorable position. We prove a microlocal inclusion relation for the generalized pullback of a Colombeau functions. In order to obtain such a result we use a stationary phase theorem for generalized phase functions, which is proven in the Appendix. Furthermore we study an example, where the pullback function is coming from the generalized characteristic flow of a partial differential equation (Hurd-Sattinger).