1118-35-113 **Bing-Yu Zhang*** (zhangb@ucmail.uc.edu), Department of Mathematical Sciences, University of Cincinnati, Cincinnati, OH 45221-0025, and **Shuming Sun**, **Emmanuel Trelat** and **Ning Zhong**. *On sharpness of the local Kato Smoothing property of dispersive wave equations.* Preliminary report.

Solutions of the Cauchy problem for general dispersive wave equation

$$w_t + iP(D)w = 0, \quad w(x,0) = q(x), \quad x \in \mathbb{R}^n,\ t \in \mathbb{R} \tag{1}$$

have been shown by Constatin and Saut to possess a local smoothing property:

$$q \in H^s(\mathbb{R}^n) \implies w \in L^2(-T,T; H_{loc}^{s+\frac{m-1}{2}}(\mathbb{R}^n))$$

where m is the order of the pseudo differential operator $P(D)$. This local smoothing property is now called the local Kato smoothing property which was first discovered by Kato for the KdV equation and implicitly shown by Sjölin for the linear Schrödinger equation. In this paper, taking the linear KdV and Schrödinger equations as examples, we show that the local Kato smoothing property possessed by the solutions of of (0.1) is sharp in the sense:

The solution w does not belong to the space $L^2(-T,T; H_{loc}^{s+\frac{m-1}{2}+\epsilon}(\mathbb{R}^n))$ for any $\epsilon > 0$, in general, if its initial value $q \in H^s(\mathbb{R}^n)$. (Received January 26, 2016)