1096-35-90 **Cynthia V. Flores***, cynthia@math.ucsb.edu. *On decay properties of solutions to the IVP for the Benjamin-Ono equation.*

In this work we investigate unique continuation properties of solutions to the initial value problem associated to the Benjamin-Ono equation given by

$$\begin{cases} \partial_t u + \mathcal{H}\partial_x^2 u + u\partial_x u = 0, \quad x,t \in \mathbb{R} \\ u(x,0) = u_0(x) \end{cases} \tag{1}$$

with $\mathcal{H}$ denoting the Hilbert transform

$$\begin{aligned} \mathcal{H}f(x) &= \frac{1}{\pi}\,\text{p.v.}(\frac{1}{x} * f)(x) = \frac{1}{\pi}\lim_{\epsilon\downarrow 0}\int_{\epsilon<|y|<\frac{1}{\epsilon}} \frac{f(x-y)}{y}dy \\ &= -i\left(\text{sgn}(\xi)\,\widehat{f}(\xi)\right)^{\check{}}(x). \end{aligned}$$

in weighted Sobolev spaces $Z_{s,r} = H^s(\mathbb{R}) \cap L^2(|x|^{2r}dx)$ for $s \in \mathbb{R}$, and $s \geq 1$, $s \geq r$. More precisely, we prove that the uniqueness property based on a decay requirement at three times can not be lowered to two times even by imposing stronger decay on the initial data. (Received July 19, 2013)