

1125-35-911

**Atanas Stefanov\*** (stefanov@ku.edu) and **Mats Ehrnstroem**. *On solitary waves for the Whitham equation.*

We consider the Whitham equation, defined on the whole line. Due to the smoothing nature of the linear operator, the question for existence of traveling wave solutions has been open till recently. In 2012, Ehrnström-Groves-Wahlén have constructed such waves  $\varphi(x - \mu t)$ , but only for values of  $\mu$  slightly bigger than one, even though the admissible range of wave speeds is  $\mu \in (1, 2)$ . The approach in EGW consists of a tour de force calculus of variations, supplemented by a bifurcation argument from the small KdV waves.

In this work (joint with M. Ehrnström), we construct a one parameter family of such waves, including  $\mu$  close to one, that is in the EGW range, as well as waves with wave speeds  $\mu$  close to two. In fact, we believe that the construction yields waves for the entire interval  $\mu \in (1, 2)$ , but such claim hinges upon a technical detail that is unavailable at the moment. The argument uses calculus of variation construction, very different than the one employed by EGW. In fact, it is based on constraints in appropriately selected Orlicz spaces. Finally, all our traveling waves are shown to be bell-shaped, confirming the available numerical evidence. (Received September 13, 2016)