1052-35-130 **Yuji Kodama*** (kodama@math.ohio-state.edu), Department of Mathematics, 100 Math Tower, 231 West 18th Avenue, Columbus, OH 43210. *KP solitons and shallow water waves.*

I begin with a brief summary of the recent development of classification theorem of the KP solitons [Chakravarty and Kodama, 2008-9]. The theorem shows that each soliton solution can be parametrized by a unique derrangement of the permutation group. Then I will show several real experimental pictures of shallow water waves including Mach reflection observed as an obliquely interacting wave with a rigid wall. Expressing each derrangement (i.e. soliton solution) by a unique chord diagram, I will describe the time evolution of those waves. I will also discuss the differences of KP solitons from the waves in real experiments. (Received August 24, 2009)