1064-35-266 **Mats Ehrnstrom*** (mats.ehrnstrom@ifam.uni-hannover.de), Leibniz University, Institute for Applied Mathematics, Welfengarten 1, 301 67 Hanover, Germany. *Steady water waves with multiple critical layers.*

We construct steady periodic water waves with multiple critical layers. The mathematical setting is that of the two-dimensional Euler equations with a free top boundary; the corresponding waves are rotational gravity waves propagating over water of finite depth. Using bifurcation from a particular class of eigenvalues, some of which are not simple, we find i) waves with arbitrarily many critical layers and a single crest in each period, and ii) waves with several crests and troughs in each period. The talk is based on joint work with J. Escher, G. Villari and E. Wahlén. (Received September 12, 2010)