Hydrol. Earth Syst. Sci. Discuss., 7, C2079–C2080, 2010
www.hydrol-earth-syst-sci-discuss.net/7/C2079/2010/


**Hydrology and Earth System Sciences Discussions**

# *Interactive comment on* "Groundwater fluctuations in heterogeneous coastal leaky aquifer systems" *by* M.-H. Chuang et al.

**Anonymous Referee #2**

Received and published: 30 August 2010

The article presents a mathematical derivation of a simple equation to model tidal wave propagation in different subsurface geometries when leakage may take place between an aquifer and its confining unit. After deriving this equation, the authors present a number of different tests where they compare tidal wave propagation in different hydraulic settings, to help understand qualitatively how the model behaves. Essentially, they carry out a sensitivity analysis to the different parameters in their equation. Personally I like this approach, as it helps to understand the equations qualitatively. I think therefore the most important merit of this paper is this sensitivity analysis.

I missed some reflection of what the presented results would mean for real, 3d geometries and for the characterization of leakage boundaries and aquifer properties. How



can we use tidal amplitude and phase lag to identify where leakage boundaries are located? In the charts it could be an idea to normalize distance with the decay length sqrt(wS/2T)

The paper is short and to the point. The paper needs to be revised for spelling and gramatical errors.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 4473, 2010.