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Impact location of objects hitting the water surface

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Analysis of data, recorded on March 8th 2014 at the Comprehensive Test ban Treaty Organisation's hydroacoustic station off Cape Leeuwin Western Australia, reveal pressure signatures of objects impacting at the sea surface which could be associated with falling meteorites as well as the missing Malaysian MH370 airplane. The location of the sources are identified analytically by an inverse solution based on acoustic-gravity wave theory (e.g. see references below) which have been developed and validated experimentally. Apart from the direct contribution to the search efforts after the missing airplane, the method we describe here is very efficient for identifying the location of sources that result in a sudden change in the water pressure in general.

References
1. T.Yamamoto,1982.Gravity waves and acoustic waves generated by submarine earthquakes, Soil Dyn. Earthquake Eng., 1, 75–82.
2. M. Stiassnie, 2010. Tsunamis and acoustic-gravity waves from underwater earthquakes, J. Eng. Math., 67, 23–32, doi:10.1007/s10665-009-9323-x.
3. U. Kadri and M. Staissnie, 2012. Acoustic-gravity waves interacting with the shelf break. J. Geophys. Res., 117, C03035, doi: 10.1029/2011JC007674.
4. E. Eyov, A. Klar, U. Kadri and M. Stiassnie, 2013. Progressive waves in a compressible ocean with elastic bottom, Wave Motion 50, 929-939. doi: 10.1016/j.wavemoti.2013.03.003
5. G. Hendin and M. Stiassnie, 2013. Tsunami and acoustic-gravity waves in water of constant depth, Phys. Fluids 25, 086103, doi: 10.1063/1.481799.
6. U. Kadri, 2016. Acoustic-gravity waves from an oscillating ice-block in arctic zones. Advances in Acoustics and Vibration, 8076108, http://dx.doi.org/10.1155/2016/8076108
7. T.C.A. Oliveira, U. Kadri, 2016. Acoustic-gravity waves from the 2004 Indian Ocean earthquake and tsunami. Journal of Geophysical Research: Oceans. doi: 10.1002/2016JC011742