Small Grant Report

SG30 : Developing hydrodynamic modelling capacity in Orkney Waters

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Overview

Funding from this grant has been used to buy a license for MATLAB. Matlab is powerful software widely used in oceanography, and it is indispensable for data processing of the hydrodynamic models that are being implemented by ICIT for the Pentland Firth.

Benefits of this award

Analysis and visualization of oceanographic data (including measurements and output from numerical models) increasingly relies on high-level software applications, and MATLAB has demonstrated to be one of the preferred options for the research community.

This award and the acquisition of Matlab licence have made possible the creation of input files and analysis of results for and from numerical models to predict and study tidal currents in the Pentland Firth. Other open source software, e.g. R, have similar capabilities than Matlab, and choosing one or another is obviously up to the final user. In my case, I am used to work with Matlab and therefore it contributes to develop my work more efficient.

Interaction with MASTS community

The Marine Alliance for Science & Technology for Scotland (MASTS) has a key role in the TeraWatt project (funded by EPSRC), which investigate environmental impacts of wave and tidal energy extraction through the developing of numerical modelling capabilities. Therefore, outputs from this small grant have been useful for this project, since inputs and outputs for the models have been created and analyzed in Matlab.

Outputs related with the Matlab purchase

Outputs from my work have been recently presented at the EWTEC conference [1] and all the figures and data on the tables in that paper have been created and obtained by using Matlab, which gives an idea of the relevance of the software in the deliverables of my work.

Future plans for building on the grant

An increasing number of open source tools developed in Matlab are available for oceanographic purposes. Some of them that I used recently are: a)t_tide [2], which is a toolbox for harmonic analysis and b)Dashboard: graphical user interface for fast and easy Delft3D model input generation, developed by OpenEarth. That means that Matlab has become an essential tool for undertaken numerical modelling research and I cannot imagine any present and future work without it.

[1] S. Baston, R. Harris, D. K. Woolf, R. A. Hiley, and J. C. Side, 'Sensitivity Analysis of the Turbulence Closure Models in the Assessment of Tidal Energy Resource in Orkney', presented at the 10th European Wave and Tidal Energy Conference, Aalborg, 2013.

[2] R. Pawlowicz, B. Beardsley, and S. Lentz, 'Classical tidal harmonic analysis including error estimates in MATLAB using T_TIDE', *Computers & Geosciences*, vol. 28, no. 8, pp. 929–937, 2002.