

## ***Interactive comment on “QUAGMIRE v1.3: a quasi-geostrophic model for investigating rotating fluids experiments” by P. D. Williams et al.***

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This article provides a comprehensive description of the Quagmire model including information on the numerical schemes and programming techniques used that is of a sufficient detail that it appears that it would be possible to re-implement the model from the paper alone. Model descriptions with this degree of detail are exactly the material which GMD was established to publish and this paper therefore falls well within the scope of the journal.

I have not yet analysed the text of the paper in sufficient detail to provide a detailed review, however the source code submitted with the paper raises some issues which the authors should consider. It seems in keeping with the rapid open review process of GMD to provide feedback on these issues at this early stage to allow the authors the

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maximum time to address them. A full review will follow at a later stage.

## Build system

The makefile supplied with quagmire contains a number of parameters which are specific to AOPP machines in Oxford. At the bare minimum this means that the statement on page 222 of the paper that the user only need type “make” to build the software is inaccurate. For a piece of software with as straightforward a build process as this one, the use of an automated system such as autoconf might be considered overkill, but the AOPP-specific settings should be removed and the README file or some other part of the documentation should contain instructions as to which changes to the makefile are likely to be needed for different sites with different compilers and library locations.

As a very minor quibble, it is usually considered good practice when producing zip or tar archives to archive an entire directory. That way, if the user is in, say, their own source directory and they unzip your archive, they get a subdirectory containing your complete source tree, rather than a whole load of files spread over the current directory.

## Dependencies

Quagmire has a dependency on the NAG numerical library. Inspection of the source code indicates that this is used to provide fast Fourier transforms and to solve banded linear systems. While the NAG library has a strong reputation in this area and is undoubtedly a suitable tool for this job, many readers and potential users of this software will not have access to it. Given that there are good freely available libraries for these two tasks (for example fftw and lapack for fft and banded linear systems respectively), it would make this software much more accessible to the wider scientific community if

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the option was presented to link against the free alternatives. Given the limited and contained use of the NAG libraries in this code base, providing an alternative ought not to be a major undertaking.

## Software licensing

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