The work titled “Convolutions on the Sphere: Commuting with Differential Operators,” is currently under consideration for publication in *GEM - International Journal on Geomathematics*. This is very fitting since the results therein rely in a crucial manner on results by the Editor-in-Chief, professor Willi Freeden, and his collaborators.

Prior to that, it was submitted to the journal *Nonlinearity*. However, after more than one year in the review process and despite the positive review from the referee, the editors deemed the manuscript not a good fit for that journal. Below, I append the correspondence from the editors of *Nonlinearity* along with the referee review to shed more light on those circumstances.

Hussein Aluie June 21, 2018

Correspondence with the editors of the journal *Nonlinearity*

----------Submission confirmation on March 26, 2017 ----------
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from: Nonlinearity <onbehalfof+non+iop.org***manuscriptcentral.com>
reply-to: non***iop.org
to: hussein***rochester.edu
date: Sun, Mar 26, 2017 at 5:05 PM
subject: Your submission to Nonlinearity: NON-102098

Dear Dr Aluie,

Re: “Convolutions on the Sphere: Commuting with Differential Operators" by Aluie, Hussein
Article reference: NON-102098

Thank you for submitting your Paper, which will be considered for publication in Nonlinearity. The reference number for your article is NON-102098. Please quote this number in all future correspondence regarding this manuscript.

As the submitting author, you can follow the progress of your article by checking your Author Centre after logging in to https://[…redacted…]. Once you are signed in you will be able to track the progress of your article, read the referee reports and send us your electronic files.

Please do not hesitate to contact us if we can be of assistance to you.

Yours sincerely

Jenny Albinus

On behalf of the IOP peer review team:
Editor: Sarah Whitehouse
Associate Editors: Eimear O'Callaghan and Phil Brown
Editorial Assistant: Jenny Albinus
non***iop.org

Editor-in-Chief: Edgar Knobloch and Carlangelo Liverani
Publisher: Daniel Jopling
Production Editor: Stephanie Daniels

IOP Publishing
Temple Circus, Temple Way, Bristol, BS1 6HG, UK

www.iopscience.org/non

Letter reference: SAu05

----------Decision on April 4, 2018 ----------
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from: Nonlinearity <onbehalfof***manuscriptcentral.com>
reply-to: non***iop.org
to: hussein***rochester.edu
date: Wed, Apr 4, 2018 at 7:16 AM
subject: Our decision on your article: NON-102098

Dear Dr Aluie,

Re: "Convolutions on the Sphere: Commuting with Differential Operators" by Aluie, Hussein
Article reference: NON-102098

Your Paper, submitted to Nonlinearity, has now been refereed and the referee report(s) can be found below and/or attached to this message. We are sorry for the delay in peer-review, we can now bring you a decision on your manuscript and we thank you for your patience.

We regret to inform you that after considering the manuscript and the reports of the referee(s) the editorial board have recommended that your article should not be published in the journal, for the reasons given in the reports. Your manuscript has therefore been withdrawn from consideration.

We would like to thank you for your interest in Nonlinearity.

Yours sincerely

Phil Brown

On behalf of the IOP peer review team:
Editor: Sarah Whitehouse
Associate Editors: Eimear O'Callaghan and Phil Brown
Editorial Assistant: Jenny Albinus
non***iop.org

Editor-in-Chief: Tasso Kaper and Carlangelo Liverani
Publisher: David Boyt
Production Editor: Sophie Bloodworth

IOP Publishing
Temple Circus, Temple Way, Bristol, BS1 6HG, UK

Impact Factor: 1.767

We are always looking for ways to improve our service and would appreciate it if you could take five minutes to complete a short survey (https:// […redacted…]) about your experience of submitting to IOP Publishing. All of your feedback is incredibly valuable to us, and we would like to thank you in advance for your help.

REFEREE REPORT(S):
Referee: 1

COMMENTS TO THE AUTHOR(S)
I thoroughly enjoyed reading this manuscript. The ideas are presented clearly and the article is well-written. I believe the results will be primarily of interest to researchers in geophysical fluid dynamics, where filtering the underlying equations is important. I do have some very minor comments/corrections detailed below. Once these are addressed my recommendation is to accept the manuscript.

Minor comments:

1. In the numerical weather prediction community it is common to "filter" the solution by including some form of hyperviscosity (or spectral viscosity). This is typically done by including some power of the (surface) Laplacian to the equations. One issue with this approach is that it is difficult to choose the power of the Laplacian and the coefficient multiplying it. The approach here seems much more elegant as one can naturally decide the scales that should be truncated. It would be nice to put in a comment along these lines.

2. There is, however, a benefit to using a hyperviscosity term for "filtering" the equations. The benefit is that it is not difficult to compute, whereas the convolution technique presented in the manuscript seems to fairly computationally expensive to compute. It would be nice to make some comments along the lines of the computational complexity of the convolutions for actual applications.

3. The title is a bit strange to me, specifically the statement after the colon. I would consider rewording the title.

4. p. 2, line 43: "mathematics" should me "mathematical".

5. Punctuation is missing after several equations, here is a non-exhaustive list: (14), (15), (67)--(75), (78)--(84), (101)--(114), (123)--(127), (128)--(136), (138)--(144).

6. p. 10, first line of Lemma 1: add "the" before "vector spherical harmonic basis".

7. p. 11, lines 322-324: remind the reader that these are normal and tangential _to the sphere_

8. p. 13, line 379: there is an extra ")".

9. p. 20, line 556: An extra equation number appears.

10. p. 23, line 640: "are are" should be "that are".

11. p. 24, reference 14: Something is wrong with the title.

COMMENTS FROM EDITORIAL BOARD:
Editor-in-Chief: 1
Comments to the Author:
The main mathematical results in the manuscript are in the fields of geometry, differential operators, and filtering theory. Section 2 reviews basic results about spherical harmonics of scalar fields and of

vector fields. Sections 3 and 4 treat convolutions of vector fields (using Edmonds basis functions) and of tensor fields, respectively. Section 5 presents central results about spherical filtering of functions, and Section 6 establishes the main new results about the commutativity of various linear differential operators with spherical filtering functions. Therefore, while I agree with the referee that these results are interesting, I think that they fall too far outside the scientific scope of the journal.

Also, I concur with the referee that these results can eventually be used by geophysicists and other scientists who study filtering for flows on 3D surfaces. However, no direct applications to any geophysical or other scientific problems are presented in the manuscript. This is a second important respect in which the manuscript does not meet the standard for publication in this journal.

As a result, I think that the manuscript is better suited for journals in applied differential geometry, spherical harmonics, or those in which [45] and [70] appeared.

Associate Editor: 2
Comments to the Author:
(There are no comments.)

Letter reference: DSR01

----------My appeal on April 4, 2018 ----------
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from: Hussein Aluie <hussein***rochester.edu>
to: tasso***math.bu.edu, liverani***mat.uniroma2.it
cc: NON Mailbox <non***iop.org>
date: Wed, Apr 4, 2018 at 10:15 AM
subject: Re: Our decision on your article: NON-102098

Dear Editors Whitehouse, Kaper, and Liverani:

I submitted my manuscript for consideration in March 2017. I was repeatedly checking on the status of my manuscript and kept being told that you have received one report and are expecting a 2nd referee report "soon."

In my prior correspondence with the journal, I specifically stated that:
"I worry that I would have waited all this time only to hear back that the results in my paper are correct but that the paper is not a good fit for the journal. I would hope that judging if my paper is a good fit for the journal should not take 9 months and would have been decided a long time ago and that my manuscript is currently only being judged on the validity of its results."

Yet, I am now shocked to see my worst fears materialize. The referee report is POSITIVE and RECOMMENDS publication, yet the journal decided to reject my manuscript since it was deemed not a good fit.

I believe something went wrong in the editorial process. I should not have had to wait for more than 1 year for the editor to deem my manuscript not a good fit. I would have hoped that the editor would have decided this at the early stages of its submission.

This decision is extremely unfair to me and the time+effort I have put into this, having had to wait for over 1 year. After all, the referee report is positive.

I kindly ask the journal to reconsider its decision. I am happy (and easily able) to address the concern of the editor by including an example application of the method. In fact, the mathematical results in the manuscript are the basis for wide-ranging results recently published in the Journal of Physical Oceanography (https://doi.org/10.1175/JPO-D-17-0100.1) which have seen considerable interest from the geophysics community. Further applications of the method are also forthcoming and I will be taking a sabbatical in 2019 to visit Princeton's GFDL to help ocean modelers there incorporate these tools into their MOM6 General Circulation Model.

An outright rejection seems to me to be an extreme decision.

Sincerely,

Hussein Aluie
James P. Wilmot Assistant Professor
Department of Mechanical Engineering
University of Rochester
Office: 585-276-7170
Cell: 410-340-3145
http://www.me.rochester.edu/~haluie/

----------Message from Editor-in-Chief on April 23, 2018 ----------
---
from: Tasso Kaper <tasso***math.bu.edu>
to: Hussein Aluie <hussein***rochester.edu>
cc: liverani***mat.uniroma2.it, sarah.whitehouse***iop.org, Tasso Kaper <tasso***math.bu.edu>, david.boyt***iop.org
date: Mon, Apr 23, 2018 at 11:02 AM
subject: Re: Our decision on your article: NON-102098

Dear Professor Aluie,

I apologize for the undue delay in the handling of your manuscript.

The editorial process for your manuscript has been carefully reviewed by us as the Editors, cc'ed on this email.

The associate editor assigned to handle the manuscript last year was unable to obtain the report of a second referee and subsequently was unresponsive despite a number of timely reminders and promises. Then, after an unsuccessful attempt to find another suitable associate editor, I took over the lead editorial responsibility for the manuscript in March. From among over 600 submissions each year, it is exceedingly rare that one of us as EiC takes over the lead editorial responsibility for a manuscript. However, in the case of your manuscript, the undue delay made this step necessary.

Professor Liverani and I have also conferred about the scientific basis for the decision about your manuscript. We fully appreciate and understand the need for careful mathematical analysis to establish key properties of the filtering methods used in geophysical fluid dynamics and other fluid dynamics problems, as well as for thorough and rigorous mathematical analysis of nonlinear phenomena in general. In fact, the decision letter explicitly states "that these results can eventually be used by geophysicists and other scientists who study filtering for flows on 3D surfaces." So, we believe that the professional judgment of the main results in your manuscript was spot on.

Applications were not discussed in sufficient detail in the submitted manuscript, and that is a decision made at the editor level, not by referees. Hence, the decision to reject the submitted manuscript stands. For manuscripts whose predominant contribution consists of presenting innovative mathematical theory, there must also be sufficient discussion of both the motivation for --and the impact on-- applications to nonlinear phenomena, for example in the form that you suggest in your email letter below, with explicit treatment of a physically-important problem in nonlinear dynamics.

We will be happy to receive from you in the future any submission which presents the integrated development of important new mathematical theory with the treatment of physically significant results for nonlinear processes involving geophysical flows, or any other manuscript on nonlinear phenomena that meets the high standards of this jointly physical and mathematical journal. In this respect, I add that I find your recent article in the Journal of Physical Oceanography (submitted May 17, 2017 and published February 2018) very interesting. I see that in section 2 of that article the implementation of the filtering method to this important problem in geophysical fluid dynamics relies crucially on fundamental properties of the filering method, especially with respect to commutativity with derivatives, as you also note in your email below. Neither the referee nor I were aware of your JPO article during the review of your manuscript, since it was apparently received by JPO after your manuscript was submitted to us. Also, the JPO article does not cite the manuscript.

Finally, as a new EiC of this journal (since January of this year) -- but one with six years previous experience as EiC of another major journal in nonlinear dynamics, I assure you that your submissions -as well as those by other authors on any other topics in nonlinear phenomena- will be treated in a timely manner.

Sincerely,

Tasso Kaper