

## ***Interactive comment on “Study on the Tidal Dynamics of the Korea Strait Using the Extended Taylor Method” by Di Wu et al.***

**David Webb (Referee)**

djw@noc.ac.uk

Received and published: 9 October 2020

### Overview

This is a classic semi-analytical study of a partially enclosed tidal system. The mathematics is fairly straightforward but the authors use the results to obtain a better physical understanding for the position of the amphidromes in the strait between Korea and Japan. The paper is well laid out and easy to read and understand. I think that in principal it should be published.

### Main suggestions

As I said the mathematics is fairly straightforward (maybe that is why JPO rejected the m/s), so I do not think all the details are needed in the final paper. In particular I think

C1

that the content of the appendices may be better placed in a separate document as supplementary material (a possibility with Ocean Science).

I am also concerned that this branch of oceanic literature always ignores similar studies that have occurred in related fields of physics - in particular microwave wave guides. There used to be a complaint about the different branches of physics reinventing the wheel and to a certain extent this is true here as the Coriolis term does not necessarily introduce major changes.

For that reason I suggest that the authors, who appear to be applied mathematicians, talk to someone with a physics or microwave background about reflections from discontinuities in impedance (refractive index in the case of light). This should give a bit more insight which they could usefully add to their conclusions.

As another possibility for future work I would also suggest treating all variables as complex and investigating how the solutions at key points change with complex angular velocity - to understand how the resonant properties of the system affect the solution.

### Detailed comments

#### 1. Title

I suggest "Study of the ..."

#### 2. Page 1, line 9

Similarly "studies of the tides ..."

#### 3. Page 1, line 23

"... the Yellow Sea ..."

#### 4. Page 1, line 26

Delete 'vast'.

#### 5. Page 1, line 27

C2

Knives are sharp, continental slopes are steep.

6. Page 2, line 18

I disagree with 'analytical', this is a semi-analytical method, using the numerical solution of a large set of equations.

7. Page 4, line 21

This is angular velocity (radians per second) Anything with frequency refers to full cycles of something.

8. Page 5, line 8

Change to 'with momentum ... "

9. Page 16, lines 10 onwards.

This is all very standard in other areas of physics as well, so I do not think the work of Dean and Dalrymple needs to be spelt out in such detail. I suggest that you just give the results you need.

10. Page 17, line 1

You do not make clear which case you are writing about - yours or that of Dean and Dalrymple.

11. Page 18, line 9 and following

"can be attributed to ...". This is a bit of a cop out, the classic response of a committee shirking responsibility. It would read better if you were disappointed about the discrepancy but that it may be due to ... .

12. Page 19, Line 21.

I would suggest you delete this line. It is doing nothing useful.

David Webb 9 October 2020

C3