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Interactive comment on "Simple algorithms to compute meridional overturning and barotropic streamfunction on unstructured meshes" *by* Dmitry Sidorenko et al.

Anonymous Referee #1

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Comment on "Simple algorithms to compute meridional overturning and barotropic streamfunction on unstructured meshes"

This paper clearly explains how to calculate the meridional overturning and the barotropic streamfunction on unstructured meshes. The method proposed avoids interpolation (which to my knowledge is the most common procedure) and preserves conservation. The paper is well written, and clearly discusses the mathematics of the computation, and the sensitivity of the parameters. I am not aware of any other publication that discusses these calculations. The paper could basically be published as it is, and it will be a useful reference for the community of ocean modellers aiming to

reproduce this calculation.

See below for some minor comments that may improve it

I find confusing the notation of the streamfunctions on top of page 4. The first one can be confused with the multiplication of two integrations when it should read a double integral.

Equations could be numbered so that it is easier to reference to them.

When explaining introducing the ways of computing the meridional overturning, stating which is method A and which is method B would ease the reading.

Could you please also state in the figure captions whether the calculation is made method A or B?

p.1 original conservation, which

p1 L8 Over recent years, a considerable

p1 double)): L15 2019)

p1 double)) L21 2009)

p.2 L5 easy-to-implement

p2 L21 of the dual mesh differ from that

p.3 L1 faces of the scalar control of the edge

p.3 L6 however care

p.3 L6 same way as in the model if fluxes are to be properly analysed.

P.3 L10 and, we would guess, generally known.

p. 4 L1 In these definitions

p.4 L2 southern latitude, in radians,

p.4 L3 because the full velocity

p.4 L10 The computational procedure is straightforward

p.5 L5 in more general cases.

P.5 L5 Does the sentence "The method B should be used in more general cases" belong here? Or do authors refer to method A?

p.6 L7 Using the coarsest bin

p.10 L1 The general idea of the simple

p10 L10 We emphasize that the algorithms described are still sensitive to parameter choices, for in each case

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