# Answers to referee #1

## General Comments

Based on the open source code OpenFOAM the authors developed some modules to enable the Foam model for simulating internal solitary waves (ISWs) in continuously stratified fluids. To resolve the case of continuously stratified fluids the k-ω SST turbulence model was modified accordingly for the variable density field. The authors proved the model performance via a series of convincing model verifications. This paper also provides two options to generate an ISW in continuously stratified fluids, the fully nonlinear models of the Dubreil-Jacotin-Long (DJL) equation method and the extended Korteweg–de Vries (eKdV) equation method. This work is a good contribution to OpenFOAM model package.

However, this model development is limited to laboratory scale ISW modelling, instead of ISW modelling for realistic oceans. k-ω SST turbulence model resolve only density case instead of temperature and salinity case, thus, this model is not applicable for real ocean waves' modelling. But a nice job for laboratory scale modelling.

## Specific Comments

Q1: For realistic ocean modelling, the important item for a ISW model is to specific ISW or generate ISW by open boundary conditions. Since no open boundary codes are developed and tested for this ISWFoam, I would suggest the authors emphasize not the modelling scale for actual ocean scale. You also have to consider temperature and salinity by applying other turbulence model for real ocean scale. A realistic density field should also be considered for model validation.

Answer: Thanks for the suggestions. It is worth noting that ISWFoam does not consider the generation process of ISWs, but focuses on the propagation and evolution of ISWs that have already been generated, and the interaction between ISWs and complex structures and topography on actual scales. In the revised version, we have added Section 5 to illustrate the application of ISWFoam at the actual ocean scale. In Section 5, the evolution of the vortex structure, the waveform inversion and breaking phenomenon of ISWs are well indicated, and the propagation and evolution of the wave train generated by waveform inversion is also accurately described through ISWFoam simulation.

Q2: Section 4.4 of 'Coriolis force analysis' should be reconsidered. The authors designed this numerical experiment just for proving the Coriolis' effect. However, this experiment should have been carefully designed. Such model settings using a 12km-long tank is not convincing for Coriolis' effect. I would suggest the authors repeat this modelling experiment using real laboratory scale (maximum 12 meter, like the ISW tank in France), or just remove Section 4.4.

Answer: Thanks for the suggestions. We have deleted section 4.4.