Idealistic Numerical Modelling in the Arkona Sea

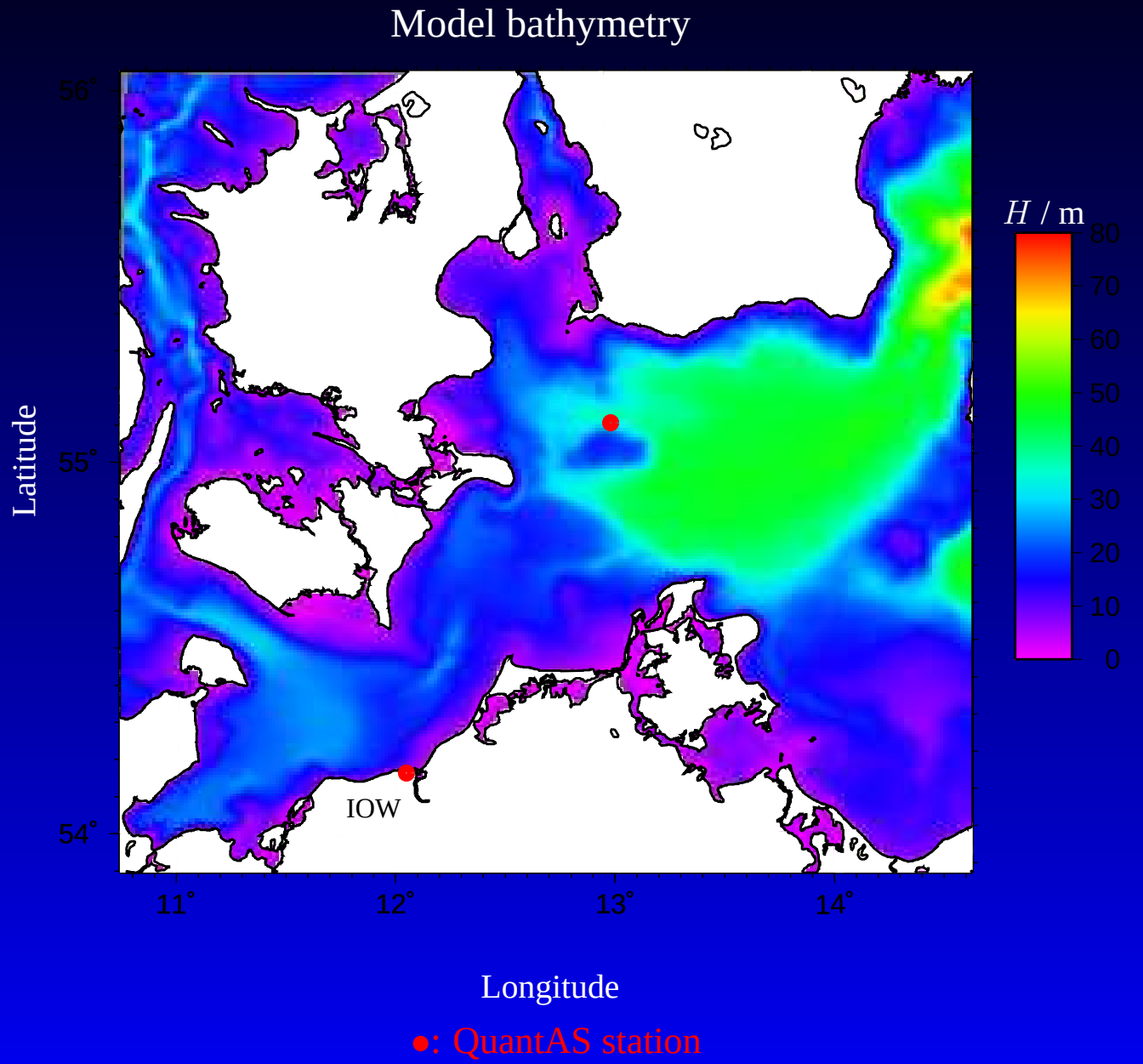
Hans Burchard and Lars Umlauf

hans.burchard@io-warnemuende.de

Baltic Sea Research Institute Warnemünde, Germany

Baltic Sea Research Institute Warnemünde

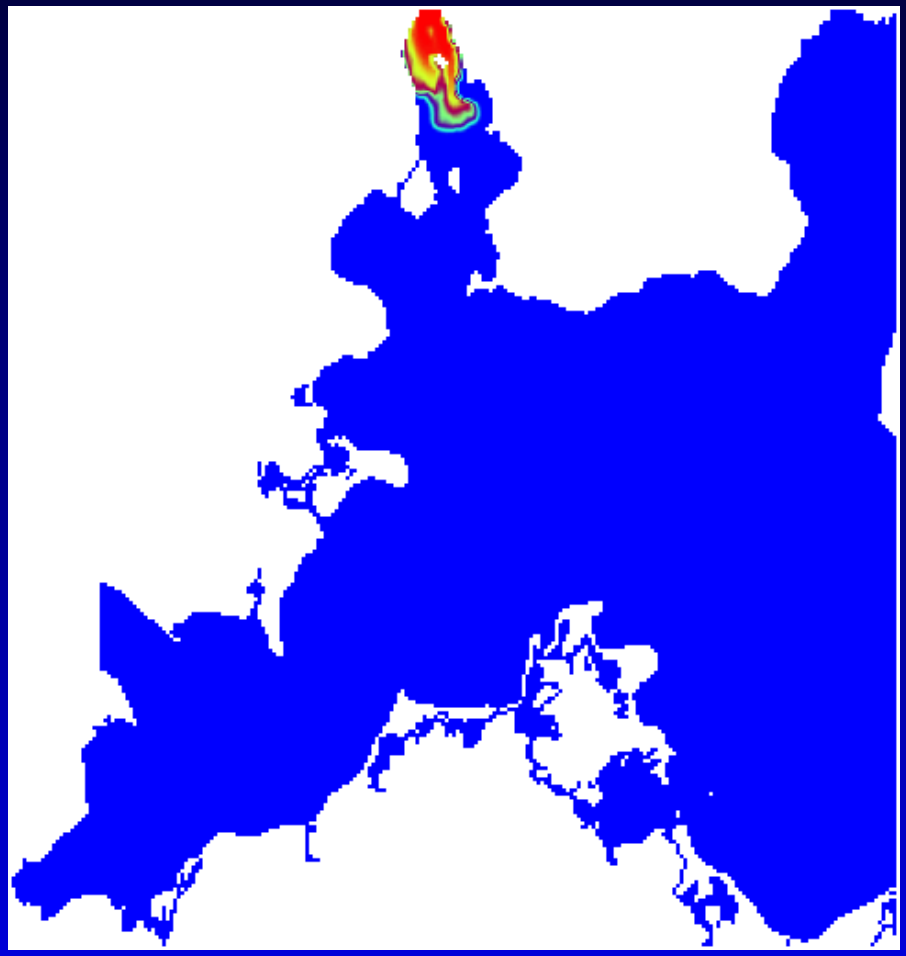
Model bathymetry



Baltic Sea Research Institute Warnemünde

Modelled salt propagation

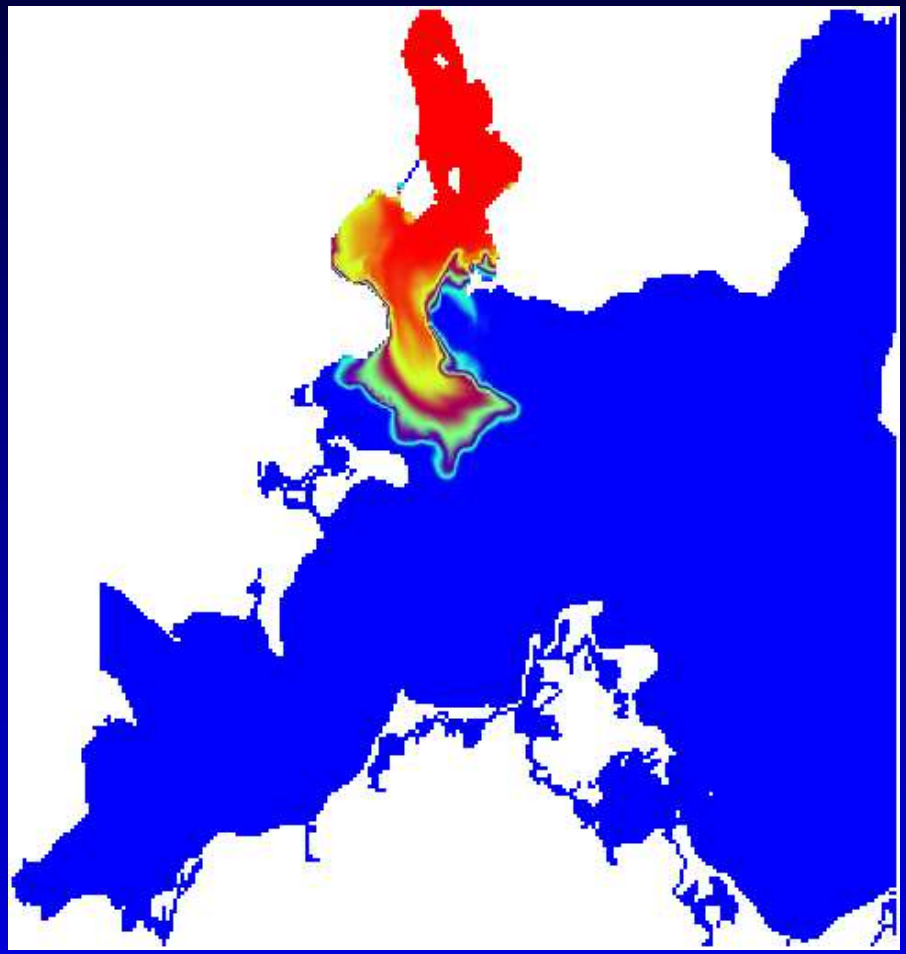
Bottom salinity (8-25 psu), 1 day after initialisation



Simulation with GETM

Modelled salt propagation

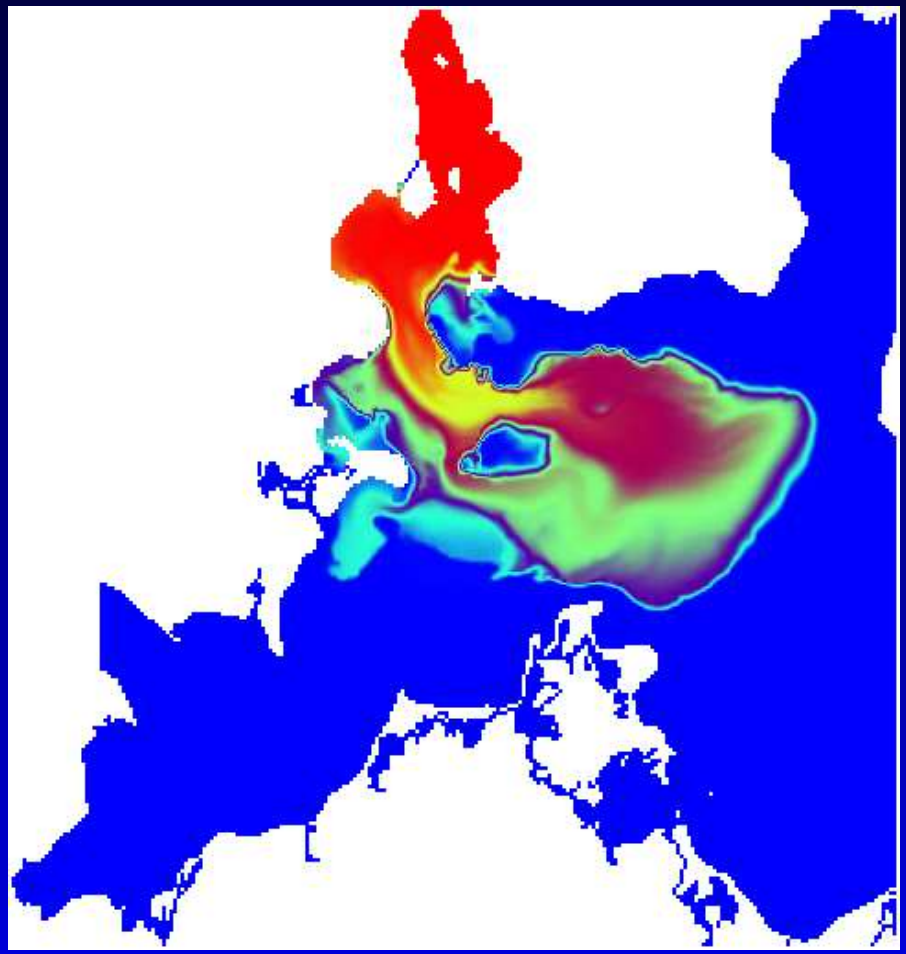
Bottom salinity (8-25 psu), 10 day after initialisation



Simulation with GETM

Modelled salt propagation

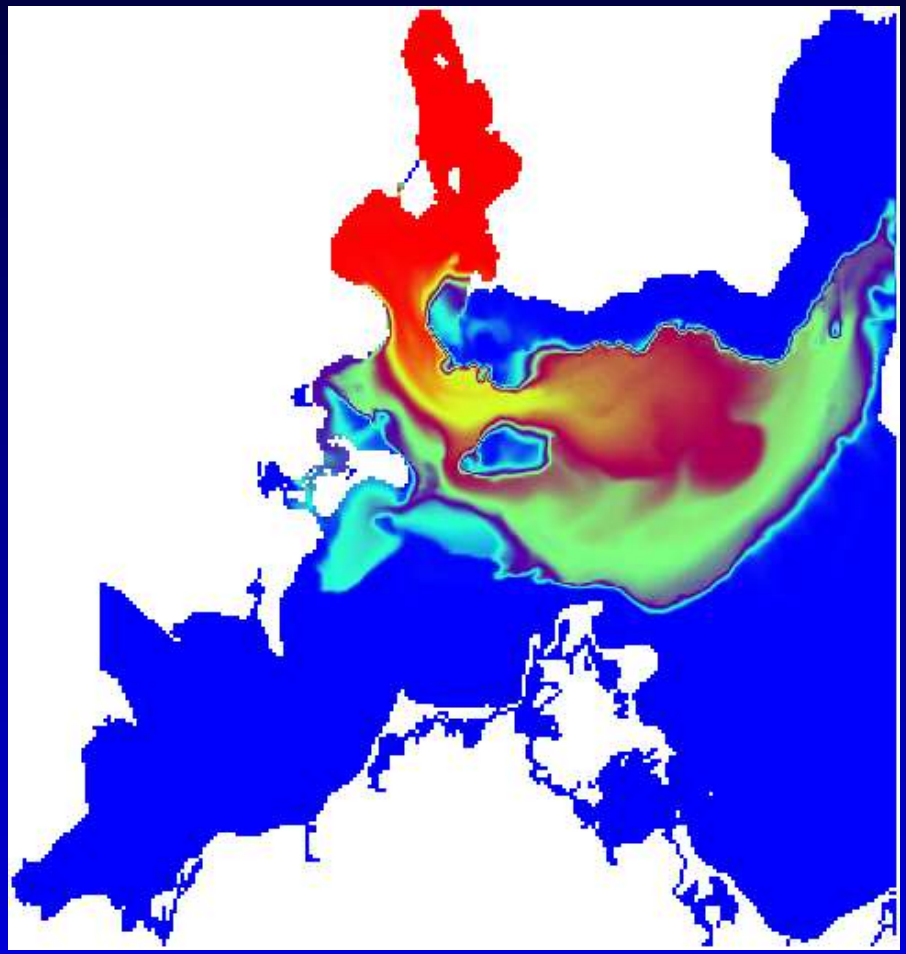
Bottom salinity (8-25 psu), 20 days after initialisation



Simulation with GETM

Modelled salt propagation

Bottom salinity (8-25 psu), 32 days after initialisation

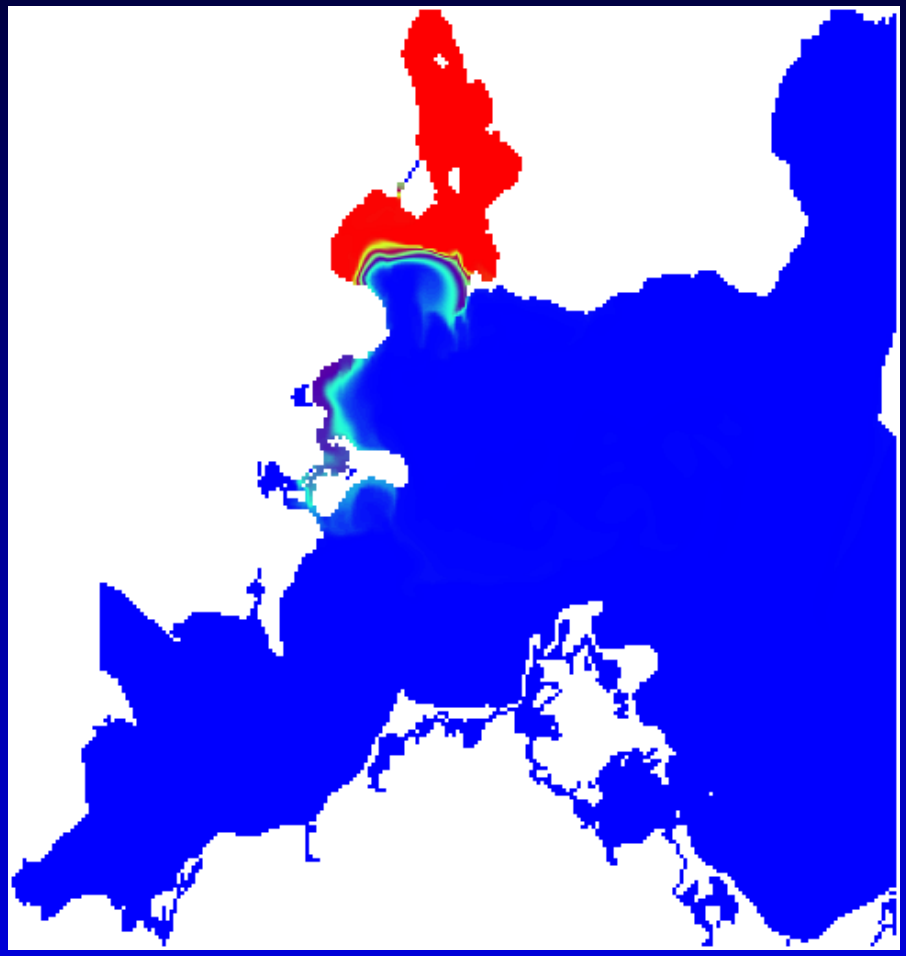


Simulation with GETM

Baltic Sea Research Institute Warnemünde

Modelled salt propagation

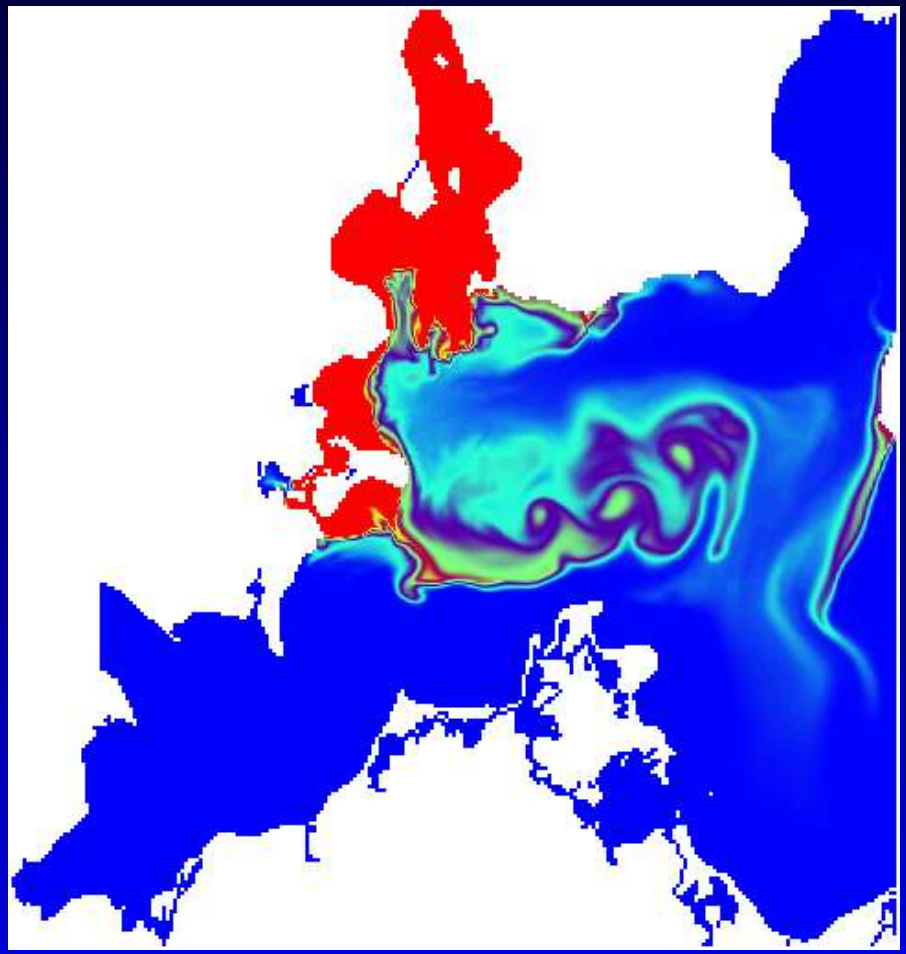
Surface salinity (8-25 psu), 32 days after initialisation



Simulation with GETM

Modelled salt propagation

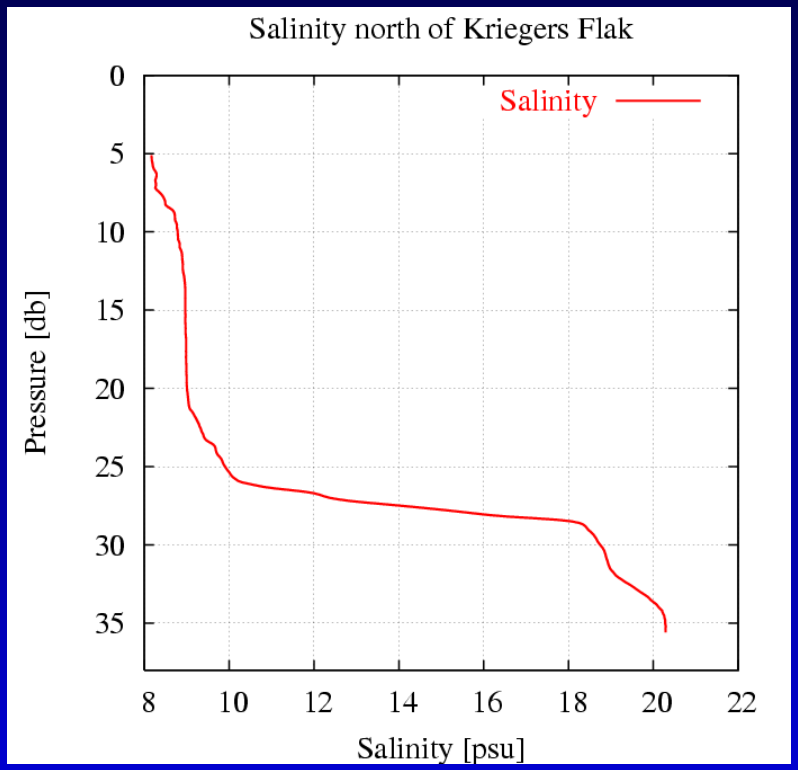
Surface salinity (8.0-8.5 psu), 32 days after initialisation

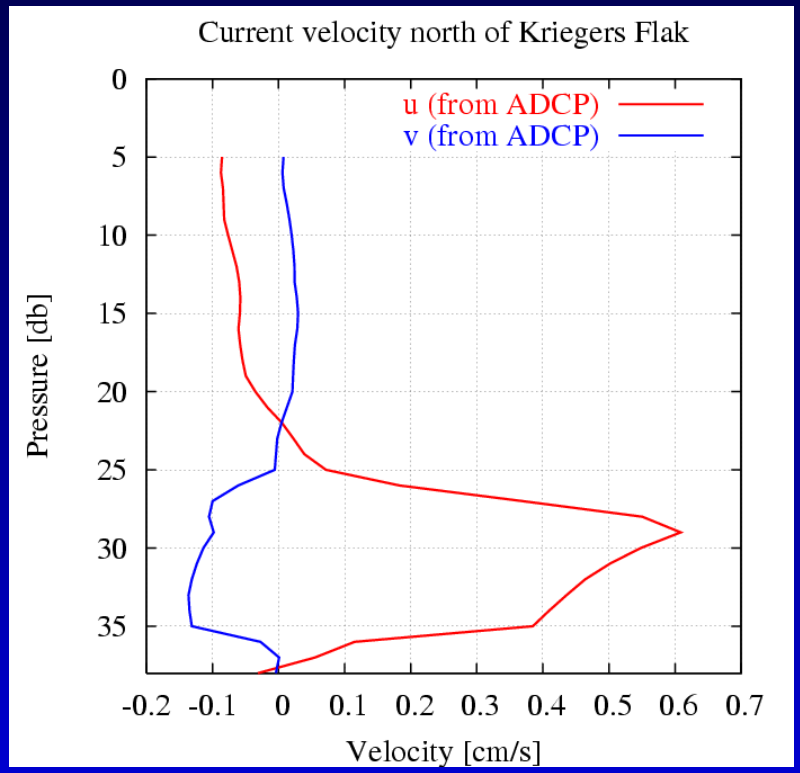


Simulation with GETM

Observed profiles

Observations from moored ship (MzB Helmsand)



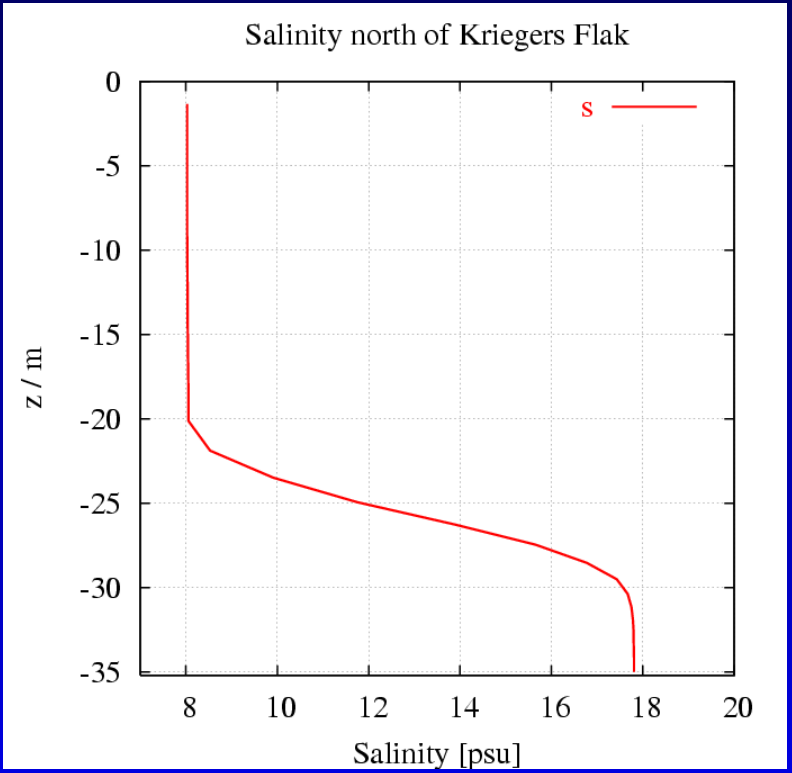


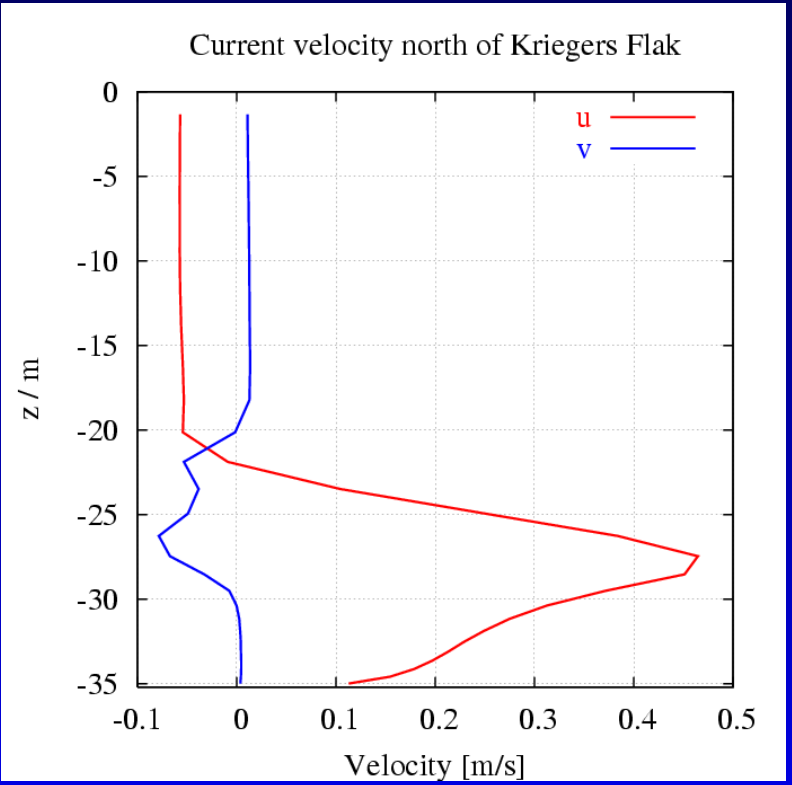
Data by Jürgen Sellschopp, Volker Fiekas, FWG Kiel

Simulated profiles

Position: 55°7’45” N, 12°59’30” E

Idealised simulations, no wind (with GETM)

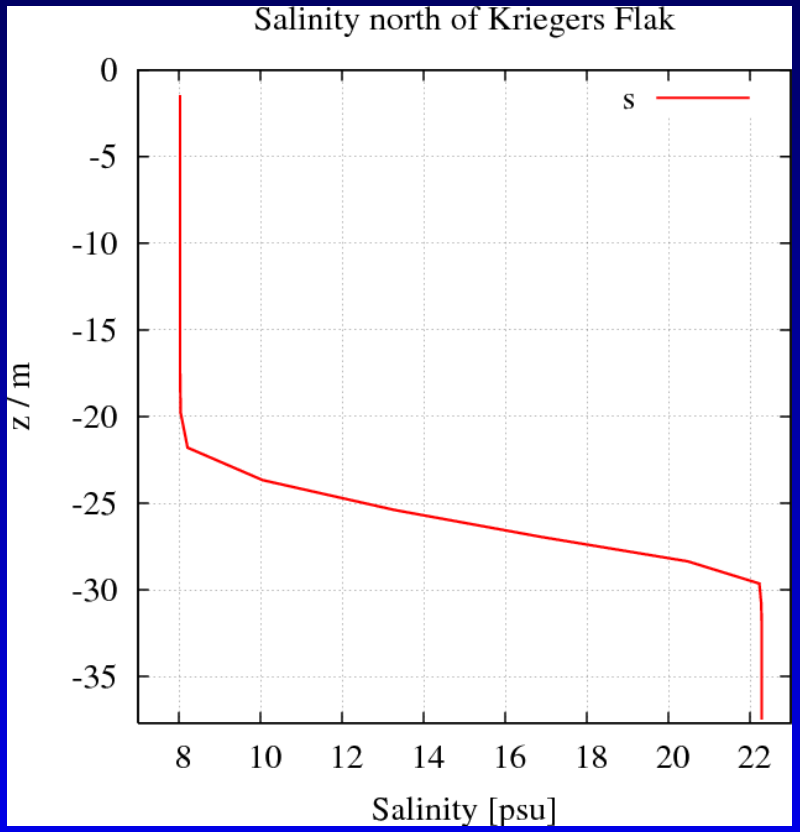


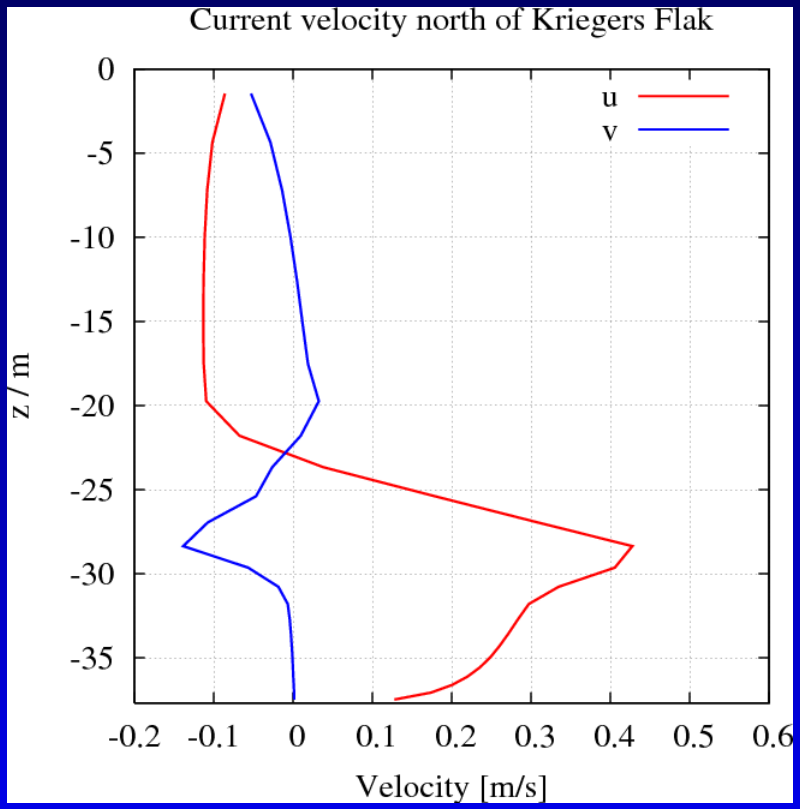


Simulated profiles

Position: 55°7’45” N, 12°59’30” E

Idealised simulations, with wind (with GETM)

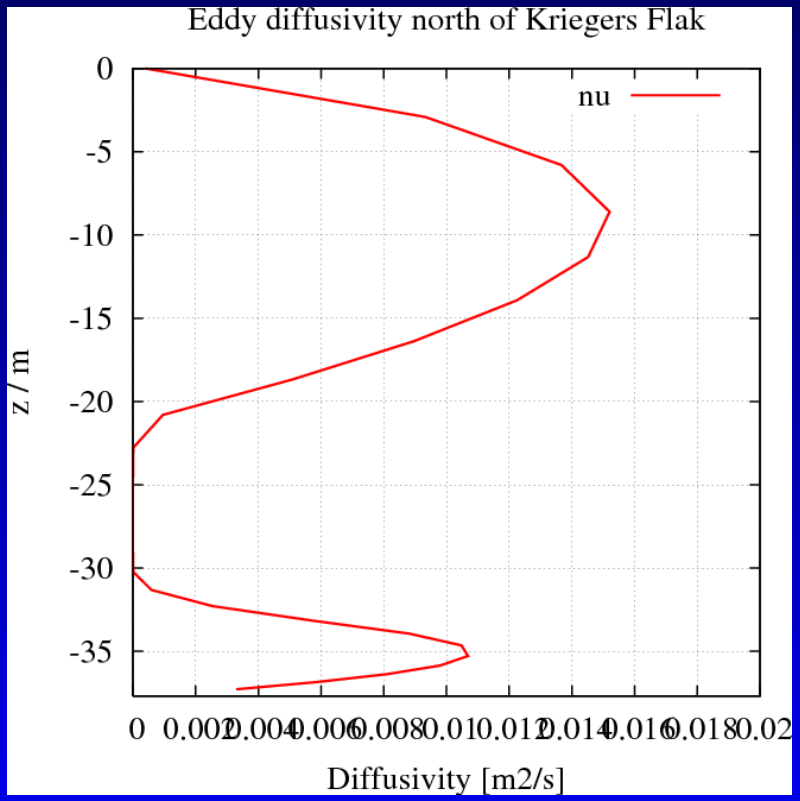


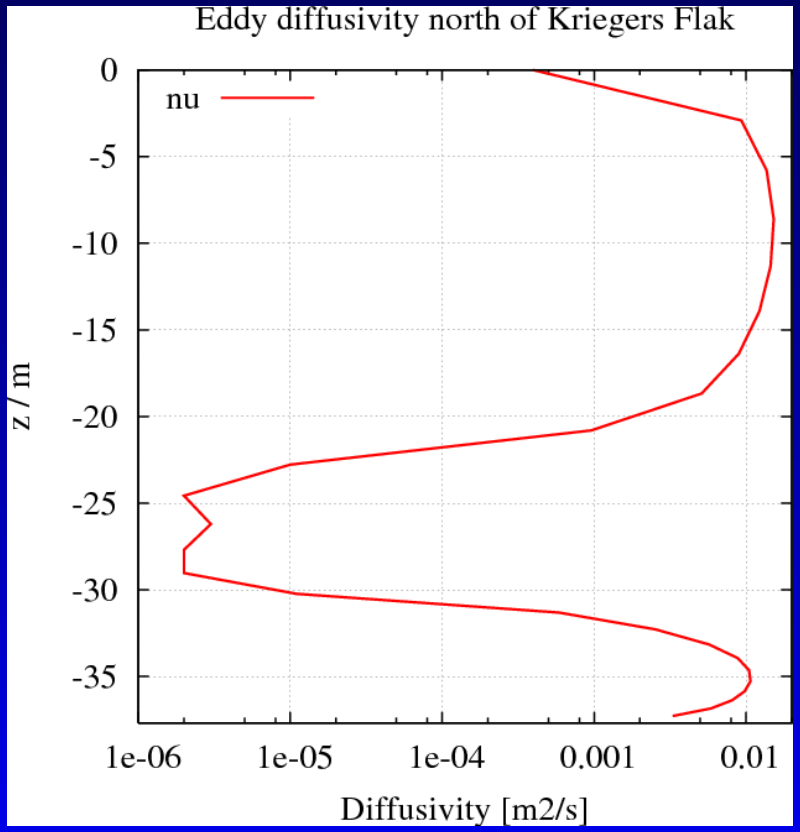


Simulated profiles

Position: 55°7’45” N, 12°59’30” E

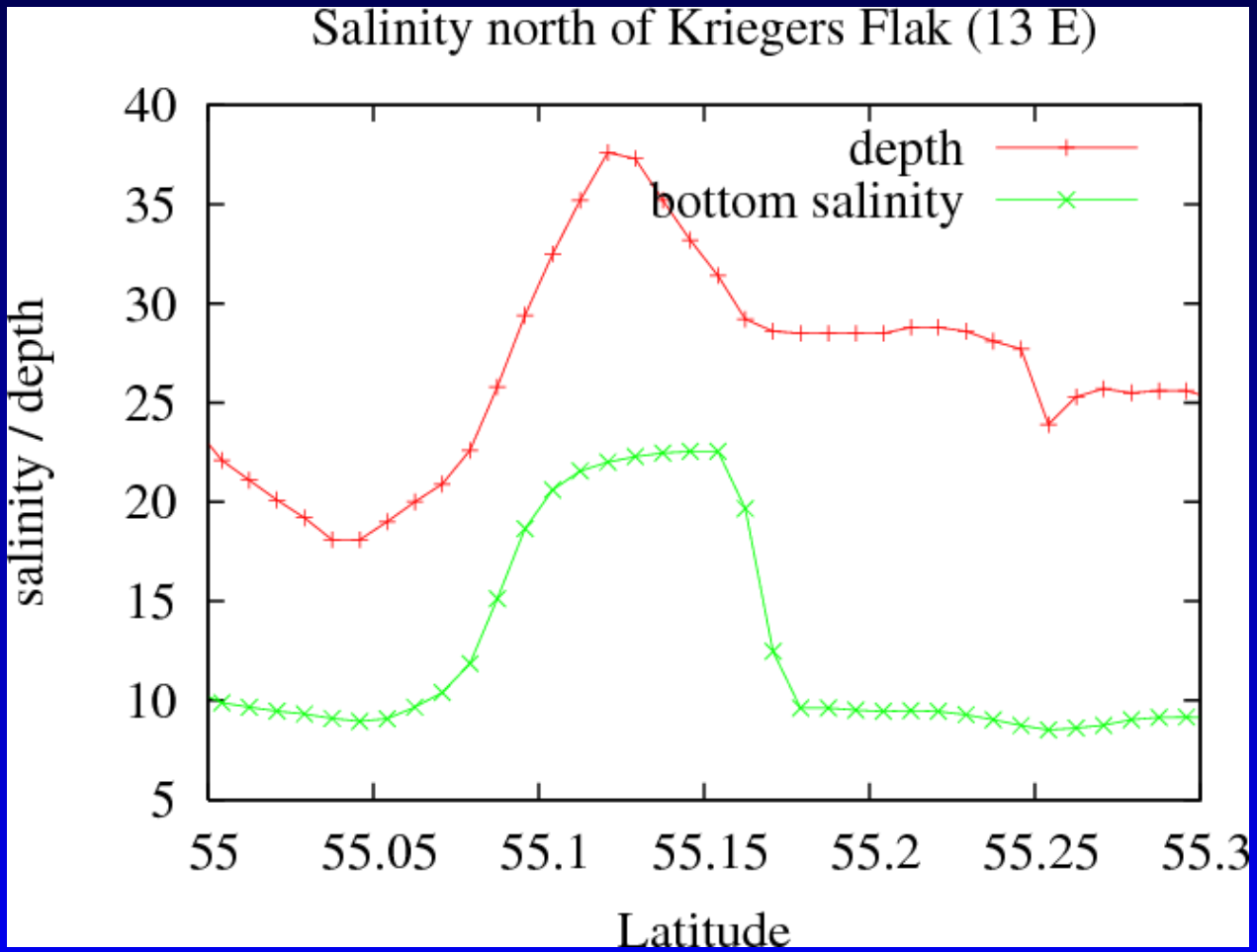
Idealised simulations, with wind (with GETM)





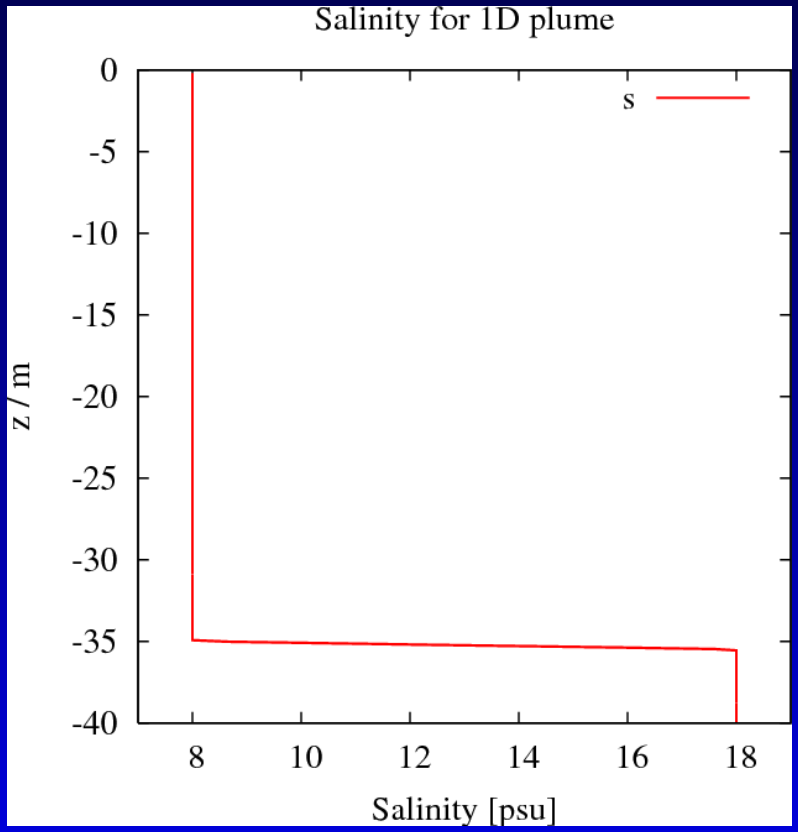
Bottom salinity

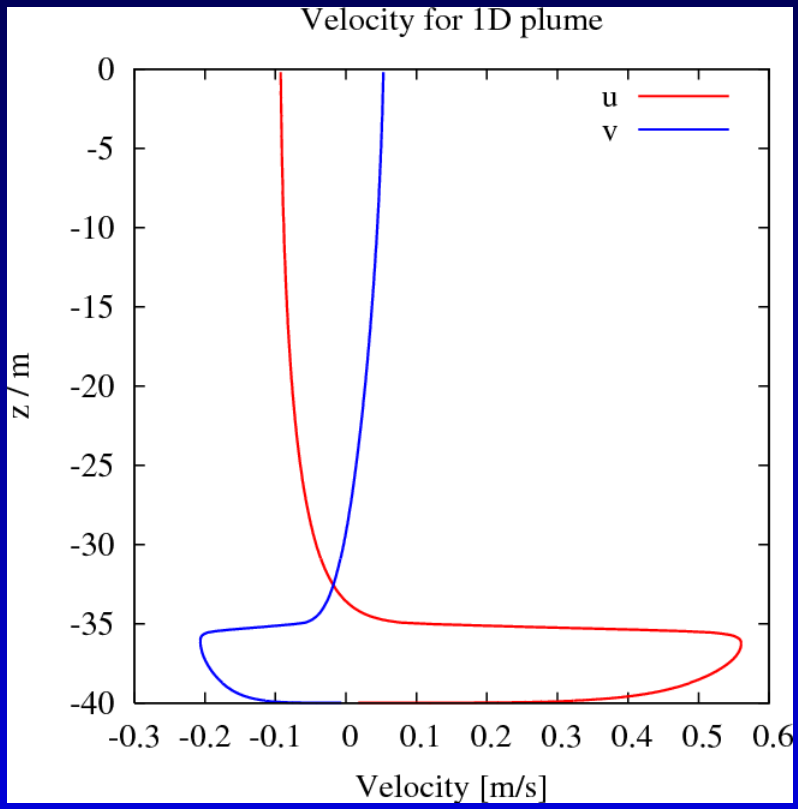
Bed salinity and depth profile at 13 E



1D models simulations

Forcing with prescribed isopycnal slope





Simulation with GOTM

Modelling road map

- Refine idealised GETM simulations, more analysis of results, still idealised, but closer to inflow observed during FWG-cruise, present at PECS Conference in October and submit manuscript to PECS special issue in November. Major aim: Qualitative interpretation of observations, mainly mean-flow properties. (responsible: Hans Burchard).

Modelling road map

- Carry out realistic GETM simulations for FWG-cruise, forcing (boundary sea levels, boundary salinity & temperature, meteorology) from observations & operational modelling. Major aim: Quantitative interpretation of observations. Submission to JPO (or so) in summer 2005. Concentration also on turbulent quantities and mixing. (responsible: Lars Umlauf).

Modelling road map

- Detailed 1D simulations of position north of Kriegers Flak. Comparison also to analytical model. Major aim: reproduction of turbulence observations. Not yet clearly defined. (cooperating: Lars Umlauf, Lars Arneborg, Volker Fiekas, Volker Mohrholz, Hans Burchard).