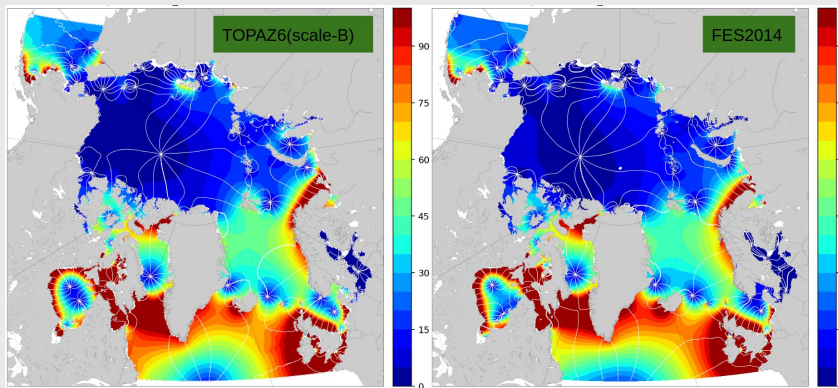


A high resolution three-dimensional model of ocean tides for the pan-Arctic region

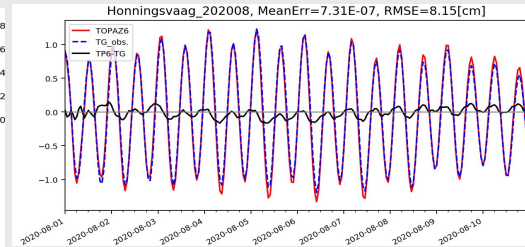
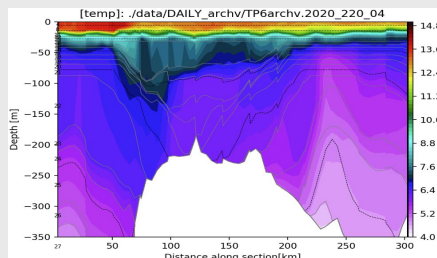
Alfath Ali, Malte Müller, Laurent Bertino, and Arne Melsom

- ❖ Tides play a key role in ocean mixing in the Arctic region
- ❖ Pan-arctic 3D HYCOM-CICE model named as TOPAZ6
- ❖ Horizontal resolution at ~3 km and 50 hybrid layers
- ❖ An eddy and internal-tide resolving model with realistic stratification
- ❖ Tidal forcing at the boundaries from FES2014 dataset

M2 amplitude and phase: TOPAZ6 vs FES2014



- ECMWF HRES atm. forcing including atm. pressure forcing at 6-hour frequency
- Lateral boundary conditions from the global NEMO forecasts
- HYCOM; special treatment of the tidal boundary conditions
- The model is operational at Met Norway and its forecasts are available at <https://marine.copernicus.eu/>
 - 10-day forecasts at 15-minute frequency



Validation:

- FES2014 (*Carrere et al., 2016*)
- Tide gauges from more than 100 locations in the Arctic (*Kowalik and Proshutinsky 1994*).
- STORMTIDE model (*Müller et al. 2012*)

The RMSE drops to 6.6cm when 6 locations near the Kanin Peninsula are excluded

