Variability of the hydrological characteristics of the Eastern Mediterranean over the last decade

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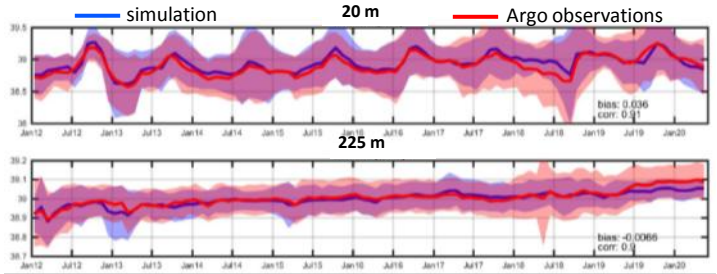
Objectives: To describe the variability of the surface and intermediate water masses in the Eastern Mediterranean over the last decade.
To understand the origin of this variability.

Methods: The analysis is based on a simulation carried out with the SYMPHONIE model (Marsaleix et al., 2008) over the whole Med. from 2011 to 2020 compared spatially and temporally to 25,000 Argo profiles over the Eastern Basin (Estournel et al., *subm*).

1. Simulation assessment

Monthly mean (and rms) salinity at 20 m (MAW) and 225 m (LIW) in the Eastern Med

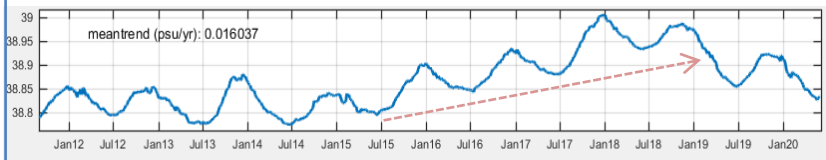


High correlation (~0.9) between model and Argo

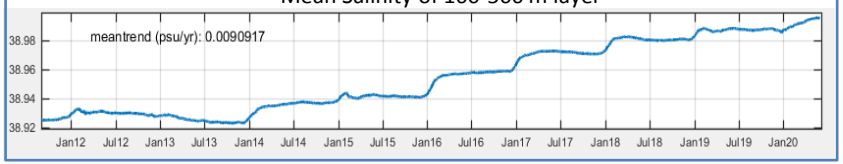
note that due to irregular sampling, no conclusion can be drawn about potential trends

2. Diagnostic from the simulation: net increase of salinity from 2015

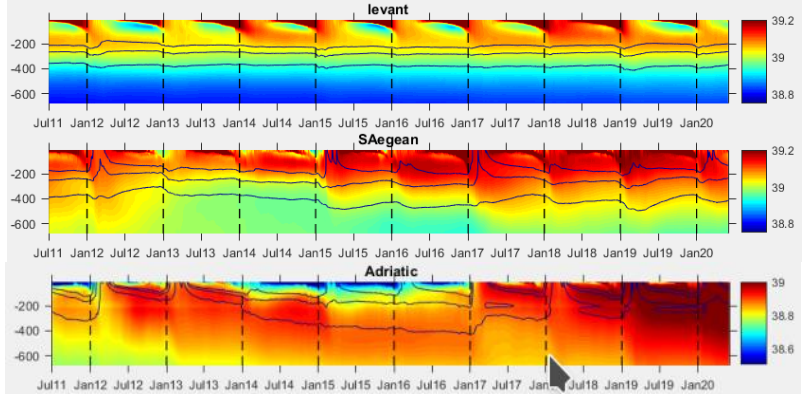
Mean Salinity of 0-100 m layer in the Eastern Med. basin



Mean Salinity of 100-500 m layer



3. Regional patterns of salinity in the regions of dense water formation



Black: isopycnals 28.9 , 29, 29.1

- Strong increase of intermediate water salinity in the South Aegean (from 2015) and later in the Adriatic (from 2017)
- Interannual variations superimposed in the Levantine (see increases in 2014 and 2018) which seem related to mild winters and shallow MLD)

4. Future Questions

1. Causes of surface salinity increase
   - Air/sea fluxes ?
   - Reduced transport of AW at the Sicily Strait?
2. Understand the strong impact on the South Aegean compared to the Levantine?
3. Impact of the Levantine on the Aegean via surface / intermediate water?
4. Impact of the Aegean on the strong increase of salinity in the Adriatic?

   Note that these two regions which were anticorrelated until 2015 as shown by Bensi *et al.*, 2016 vary in the same direction