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# ANALYSIS OF THE ENERGY AND MASS BALANCE OF THE MEDITERRANEAN SEA IN A CLIMATE MODEL SIMULATION

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This study represents an evaluation of the mass and thermal balance of the Mediterranean Sea produced by a regional climate model for the present climate conditions. The CTR-data (1961-1990) produced by the RegCM model have been considered and compared to SOC (Southampton Oceanography Centre) instrumental data (1980-2005) and data by the REMO model (1958-2001). The MITgcm model (Massachusetts Institute of Technology - General Circulation Model ) has been implemented in the Mediterranean Sea with the RegCM - CTR - data.

Fig.1- THERMAL BALANCE

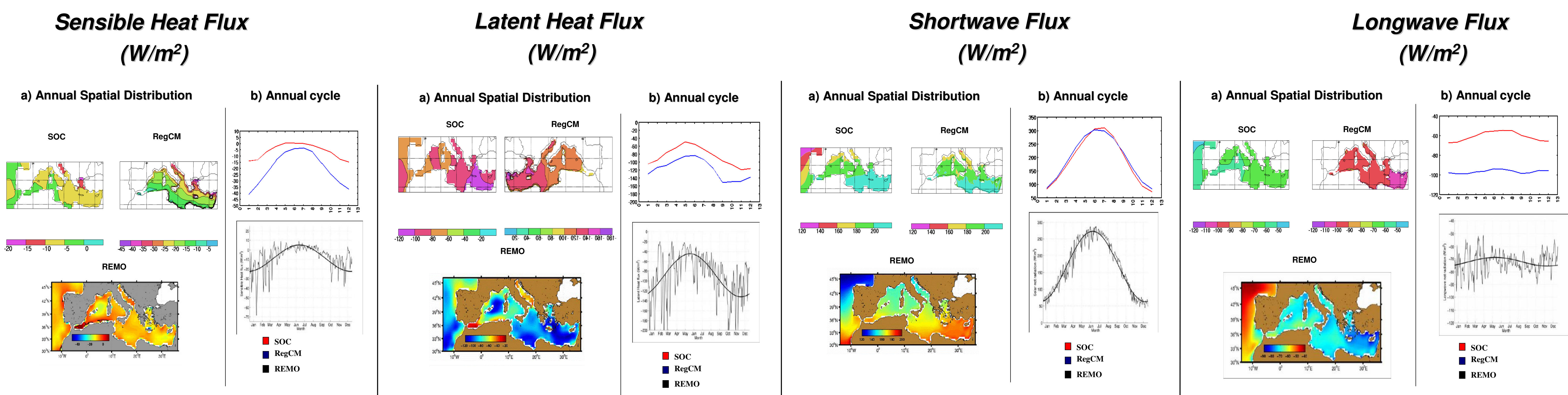


Fig.1 Spatial distribution (a) and annual cycle (b) of the thermal balance components (sensible heat flux, latent heat flux, shortwave flux and longwave flux) with RegCM, SOC and REMO data. The x-axis indicates the calendar months. The SOC fluxes are larger than those of RegCM and REMO suggesting that models underestimate the actual values.

Fig.2- MASS BALANCE

Net Evaporation (mm)

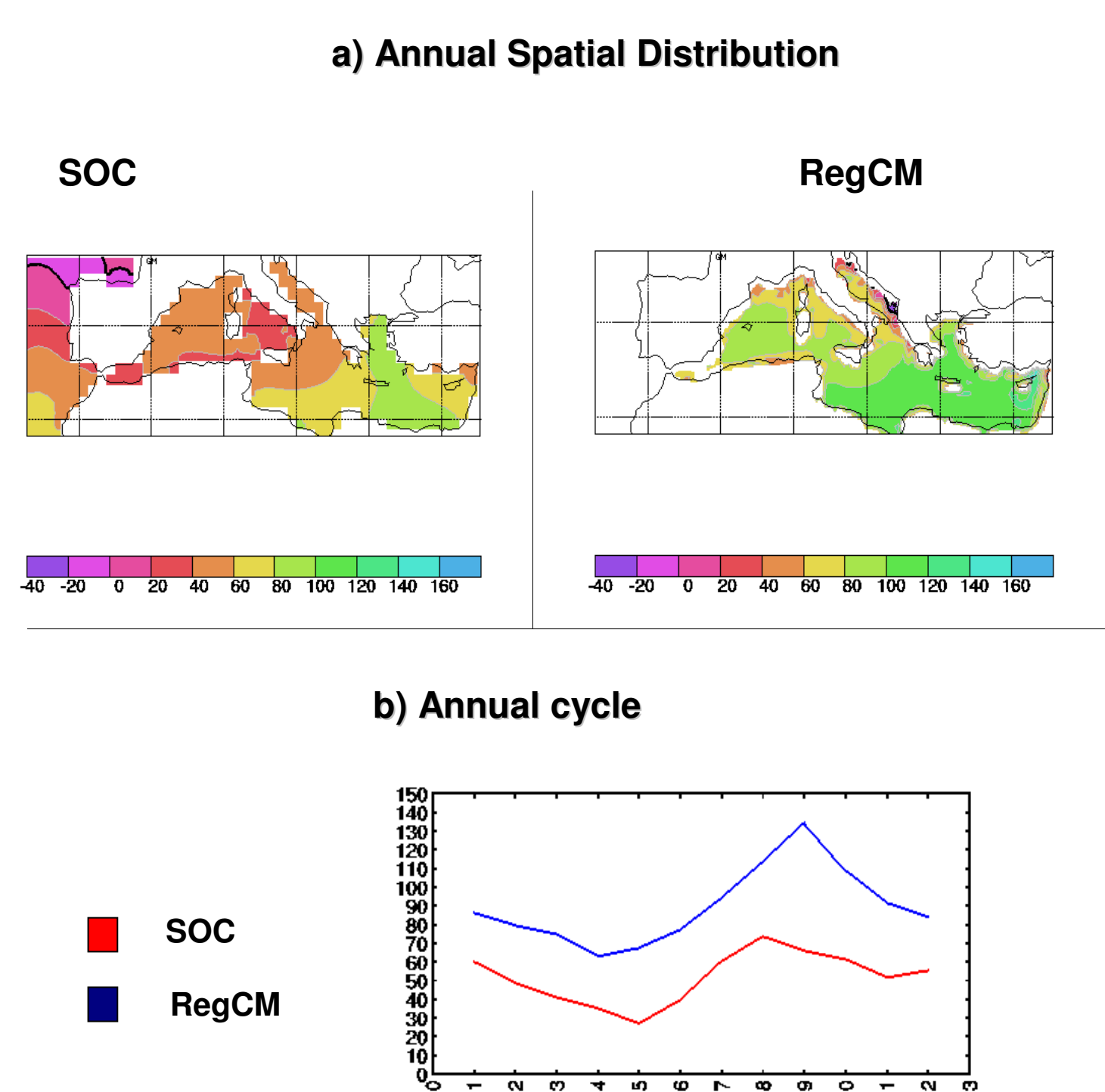


Fig.2 Same as Fig.1 except it shows the net evaporation (Evaporation-Precipitation) and only with SOC and RegCM data.

Fig.3- MOMENTUM BALANCE

Stress (N/m²)

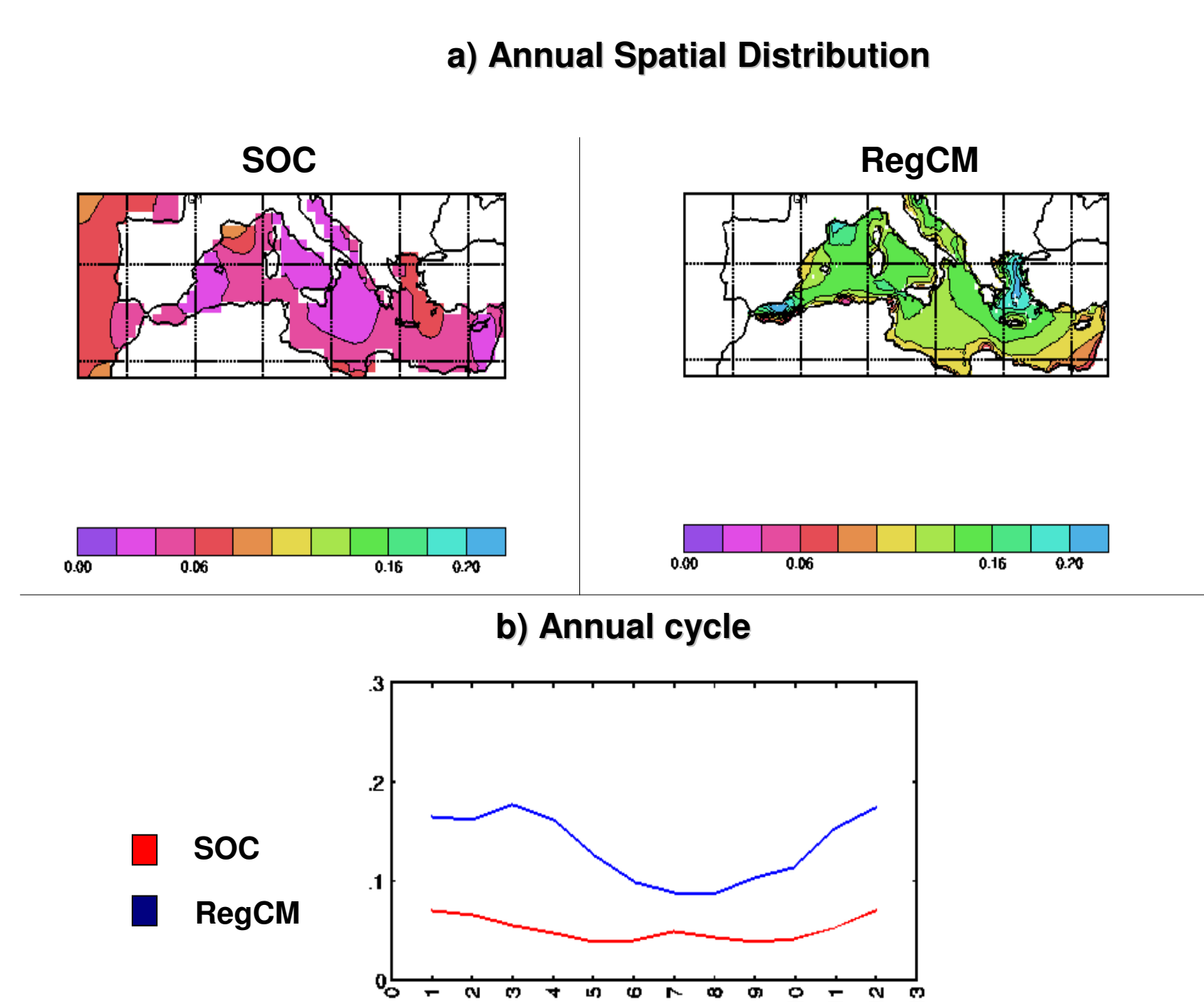


Fig.3 Same as Fig.2 except it shows the Stress (module).

Fig.4- MITgcm:

PERPETUAL ANNUAL CYCLES

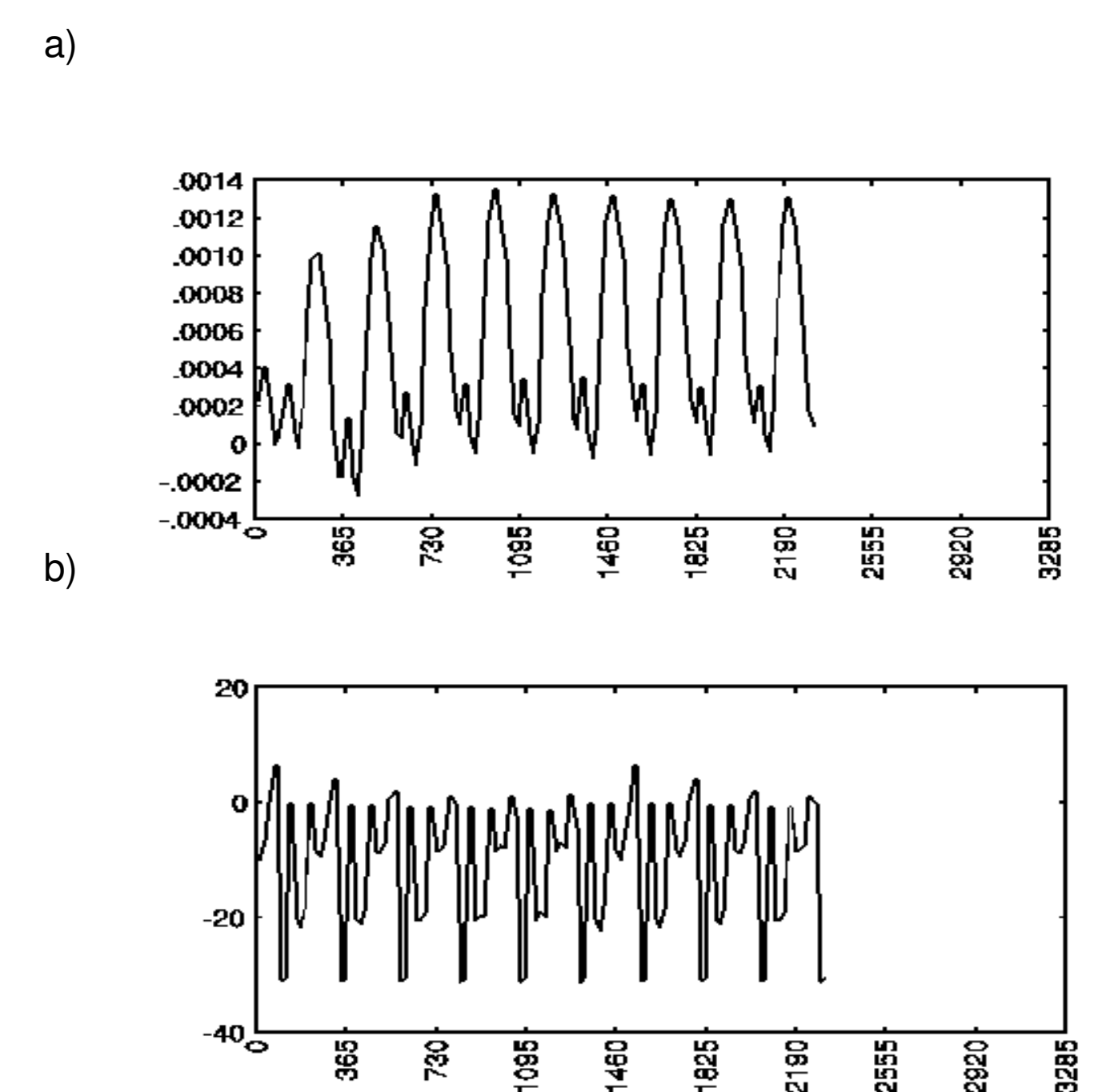


Fig.4 Perpetual annual cycle (the x-axis indicates the days) of a) Surface salinity flux (psu) and b) Surface sensible heat (W/m²) with MITgcm model in the CTR climate simulation.

The validation of the RegCM CTR simulation with observed (SOC) and reanalyzed (REMO) flux climatologies shows that RegCM provides an adequate representation of present climate fluxes in the Mediterranean region. The continuation of this study will consist in using REGCM Climate projections for the simulation of the Mediterranean Sea circulation with MITgcm.

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