Courtesy : Don Perovich

The impact of the inclusion of new sea ice processes on the simulation of sea ice in CNRM-CM5 coupled model

D. Salas y Mélia & Matthieu Chevallier

Gelato in CNRM-CM5.1 = Gelato in NEMO3.2

- Multi-(thickness) category model
- Prognostic sea ice salinity
- Enthalpy model (Cp is a function of T,S)

  Heat conduction coefficient in sea ice = f(T,S)

Sensitivity exps in forced and coupled mode

- Remove only one parameterization
  - ➔ 4 sensitivity exps
- 1970-2007 simulations, 1970-1989 discarded

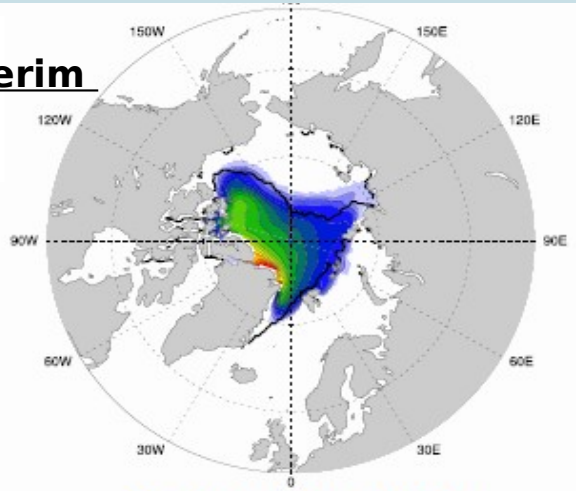
Réunion MISSTERRE
Paris, 22-23 juin 2011

METEO FRANCE
Toujours un temps d'avance

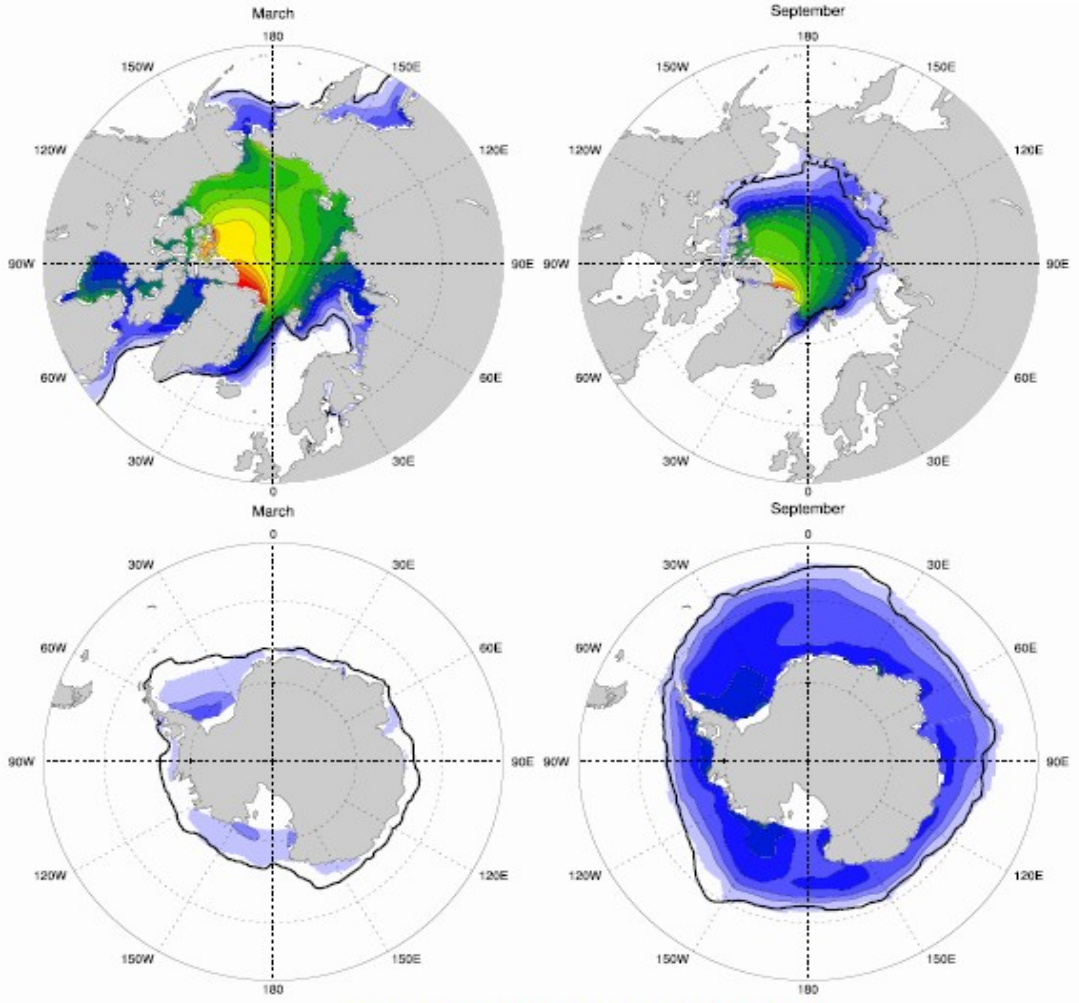
NEMO1° / Gelato5 forced experiment (« pré-DFS5 »)

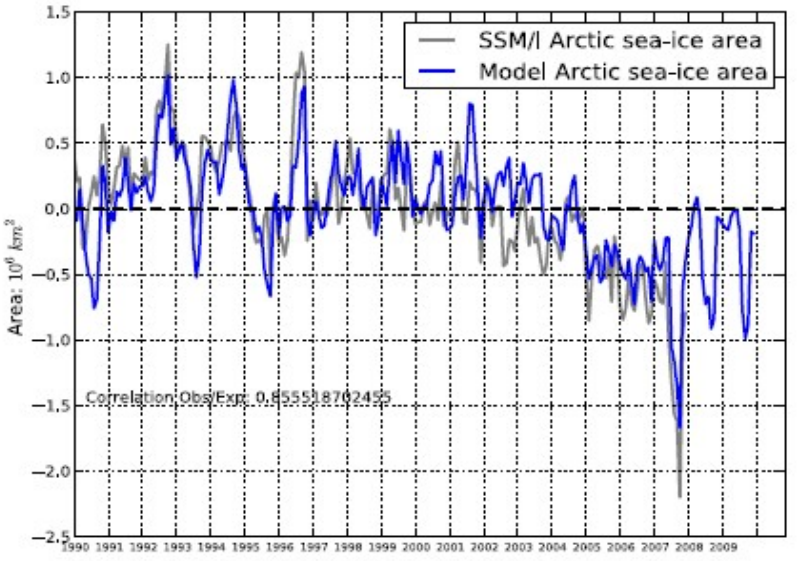
1990-2009 mean sea ice cover
- simulated by Gelato5
- HadISST ice edge in black)

Forcing: corrected ERA-interim (Lüpkes et al., 2010)



Septembre 2007





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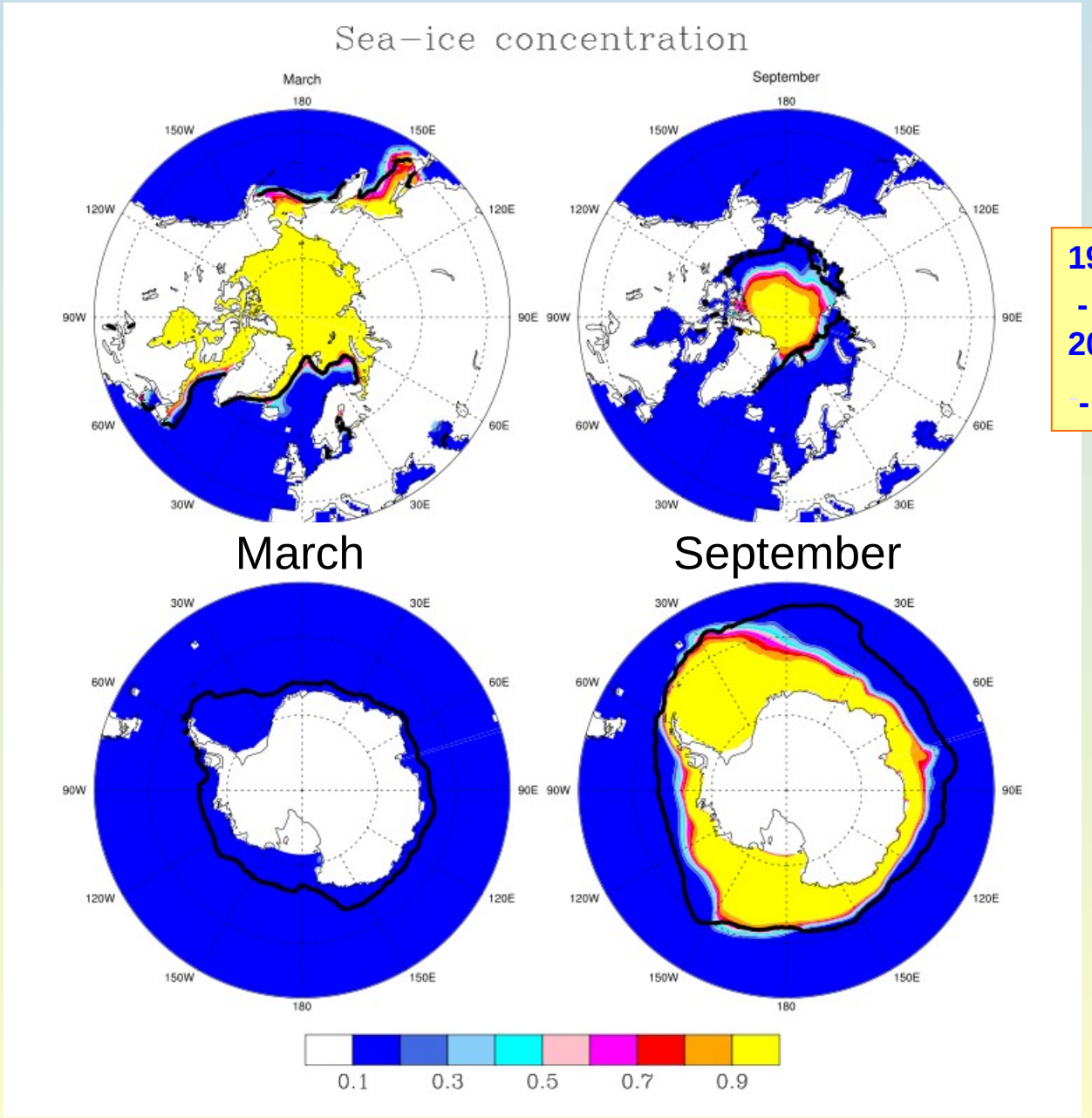
Gelato5 within CNRM-CM5 coupled experiment

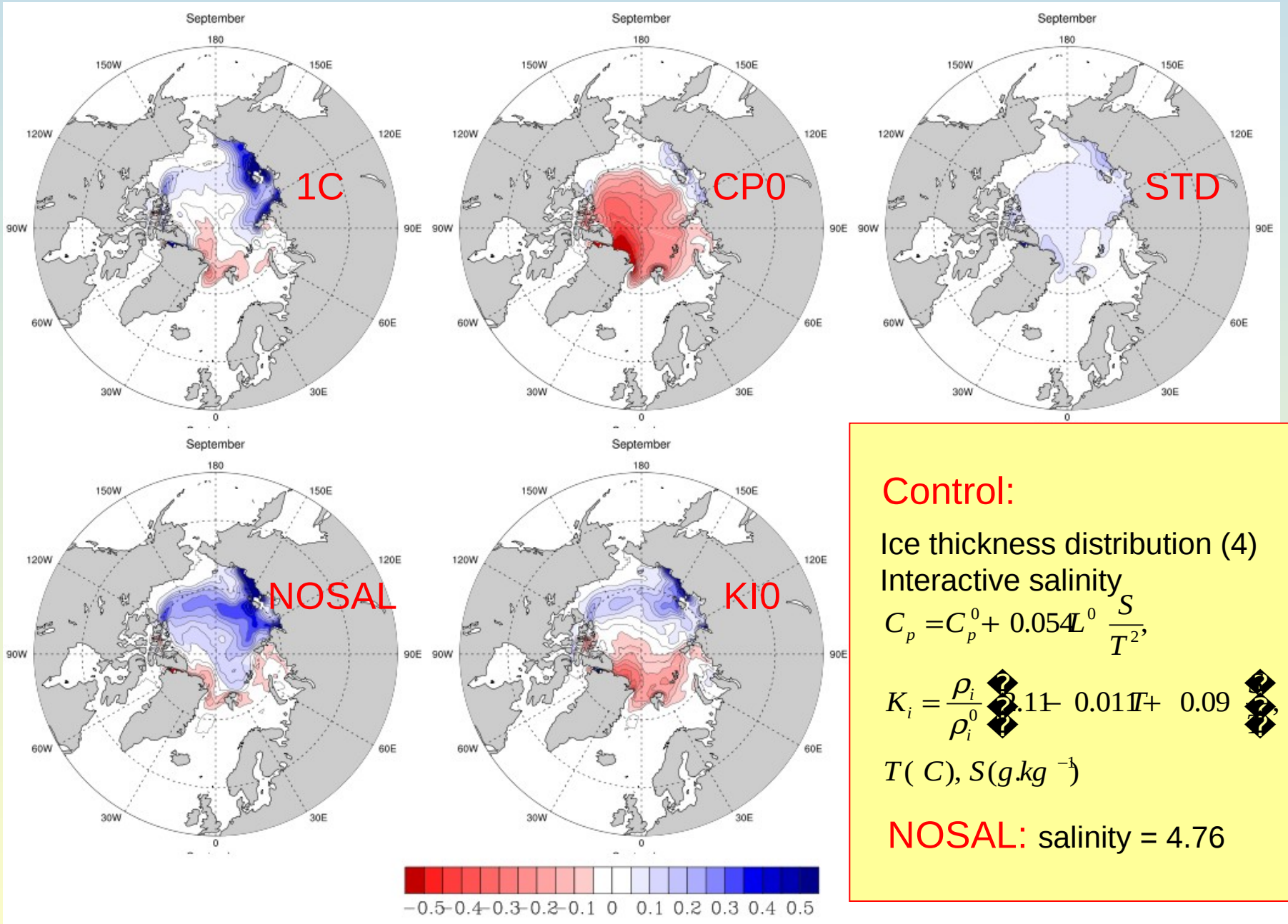


1990-2007 mean sea ice cover

- from all forcings (nat. + anthro) 1850-2012 CMIP5 experiment set, member #1

- HadISST ice edge in black

Sensitivity exps in coupled mode (forced: in progress)
Sea ice thickness anomalies SENS - CONTROL



Control:

Ice thickness distribution (4)

Interactive salinity

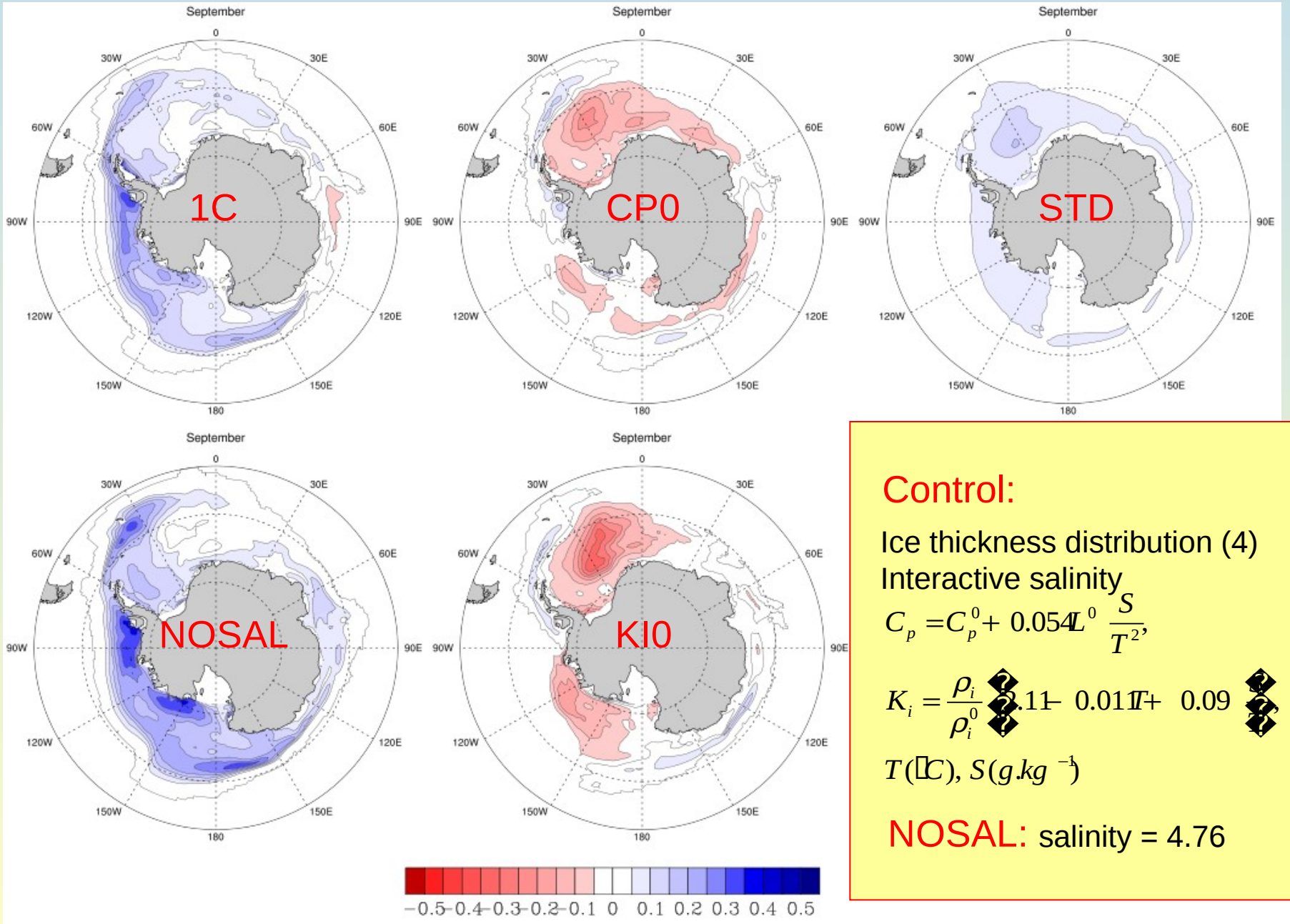
$$C_p = C_p^0 + 0.054 L^0 \frac{S}{T^2},$$

$$K_i = \frac{\rho_i}{\rho_i^0}\left(2.11 - 0.011T + 0.09\right)$$

$T(C), S(g.kg^{-1})$

NOSAL: salinity = 4.76

Sensitivity exps in coupled mode (forced: in progress)
Sea ice thickness anomalies SENS - CONTROL



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Interactive salinity

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$T(°C)$, $S(g.kg^{-1})$

NOSAL: salinity = 4.76