Possible factors controlling sea ice-atmosphere interactions from summer to winter

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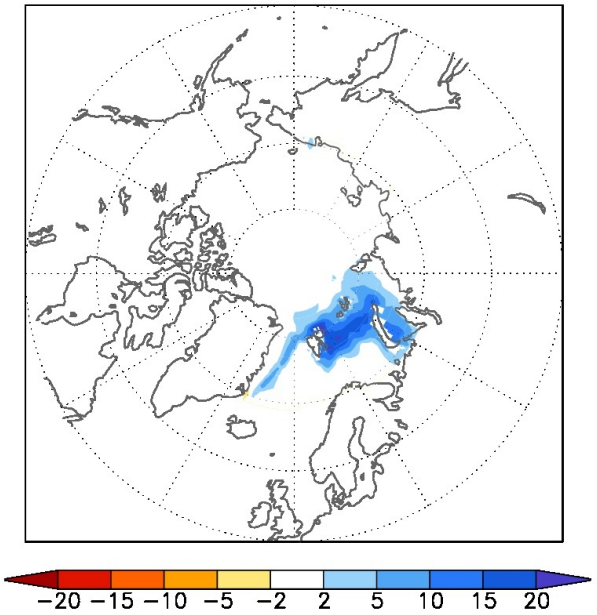
uni Research

Bjerknes Centre
for Climate Research

NCEP/NCAR Reanalysis and NSIDC data 1979-2012.

MCA(Nov,hom,1st)



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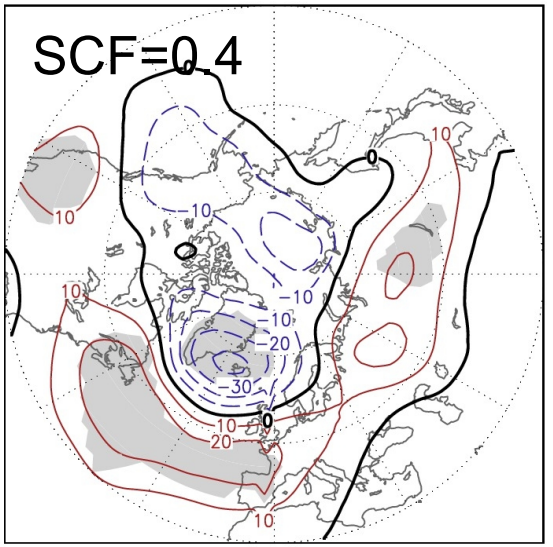
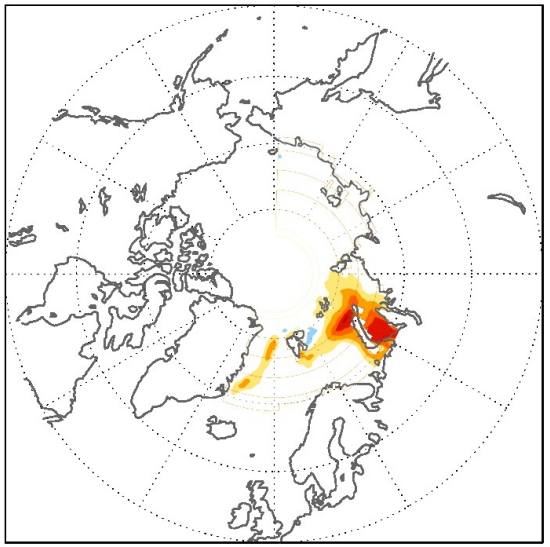


Reference SIC: Nov

First two MCA modes
between SIC and Z500

MCA(Nov,hom,2nd)



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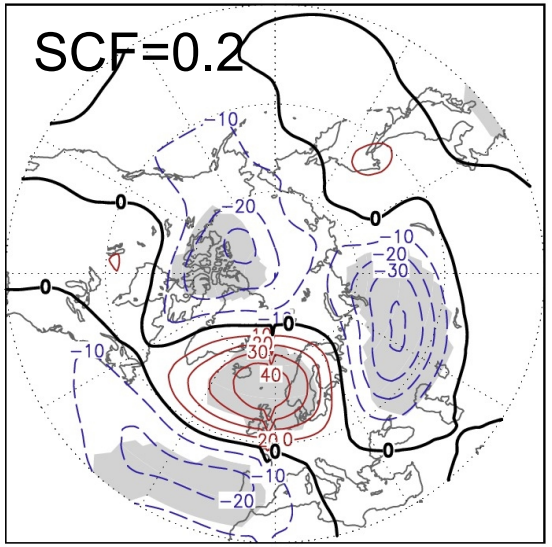

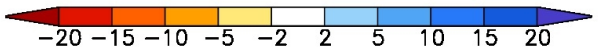

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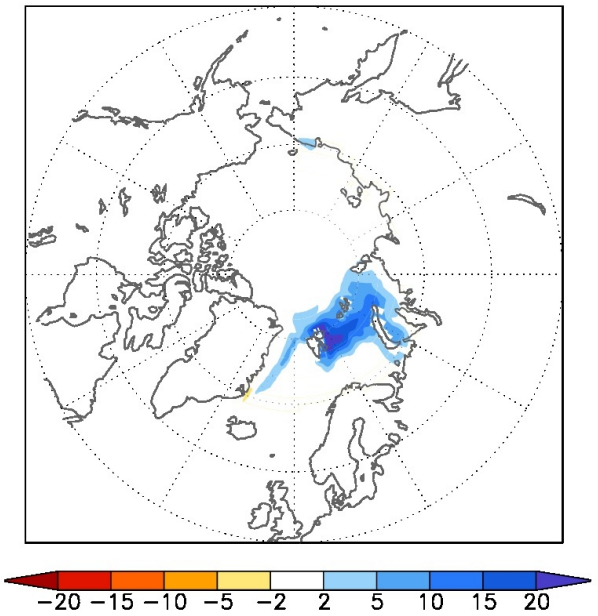

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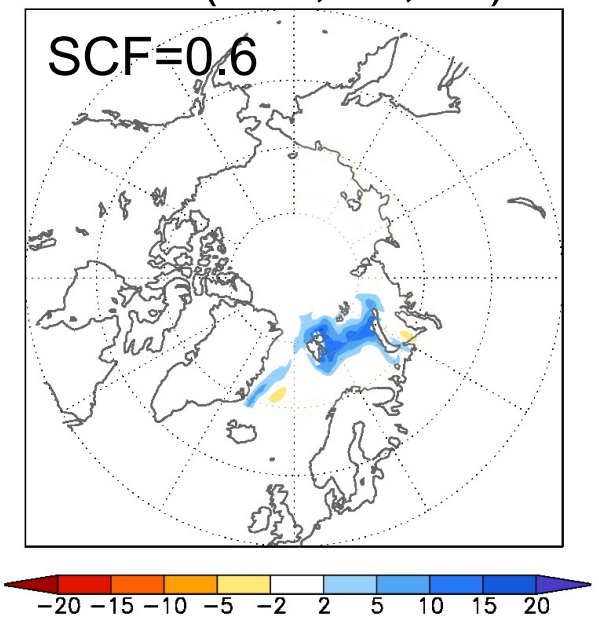

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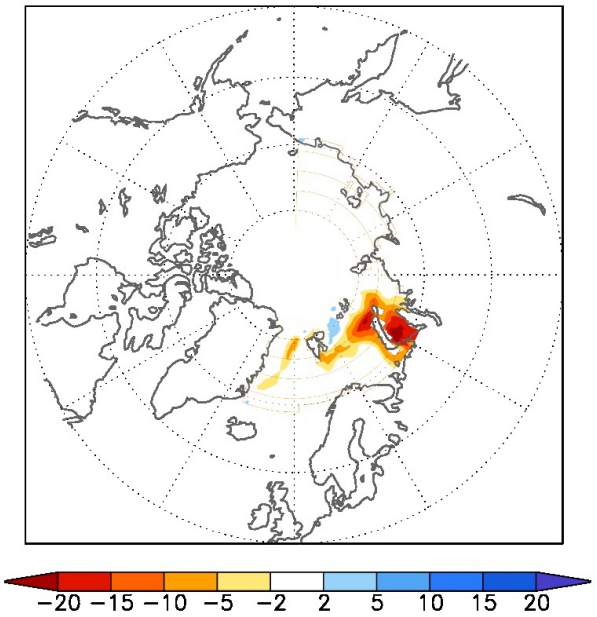

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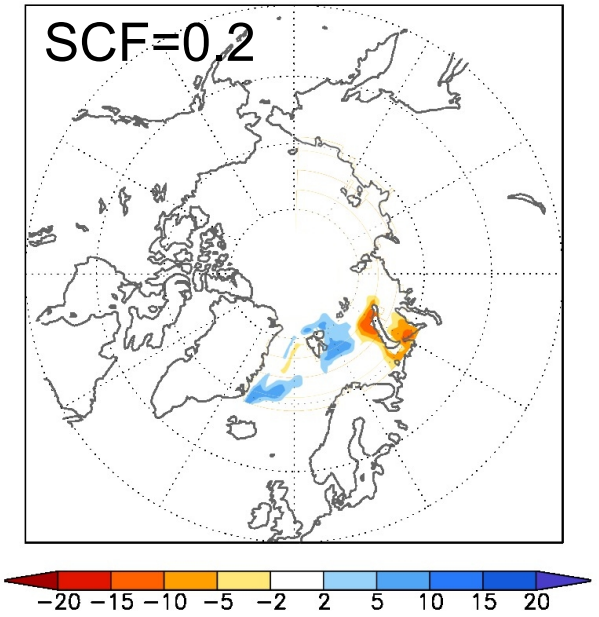
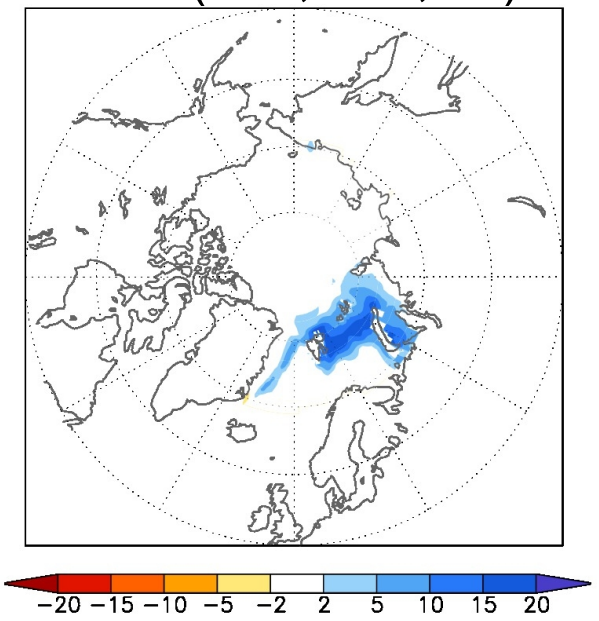


Reference SIC: Nov

First two MCA modes between SIC fields

MCA(Nov,hom,1st)



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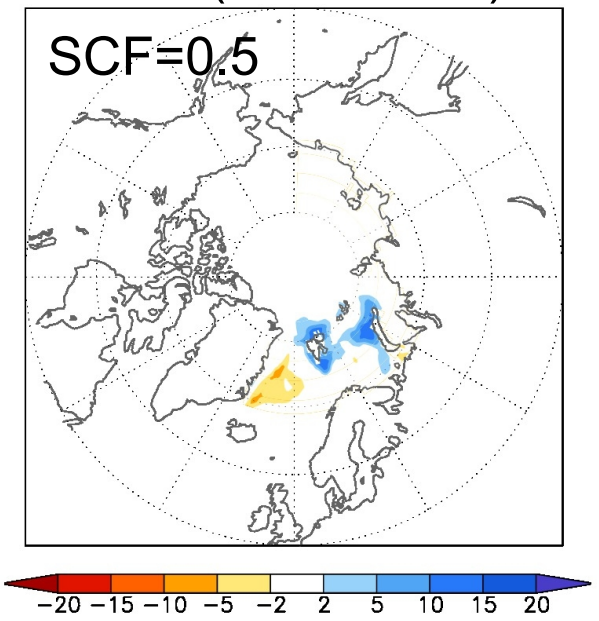

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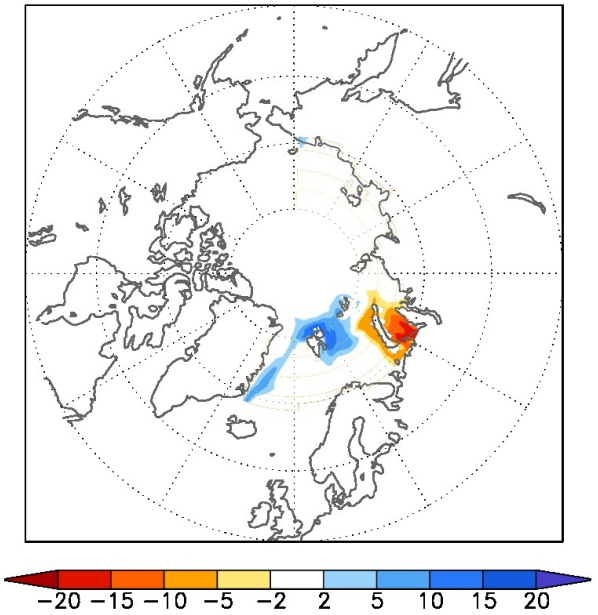

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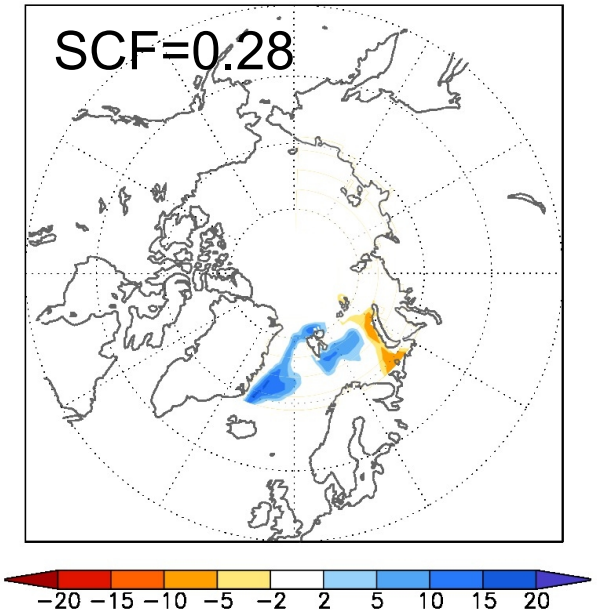

Reference SIC: Nov

First two MCA modes between SIC fields

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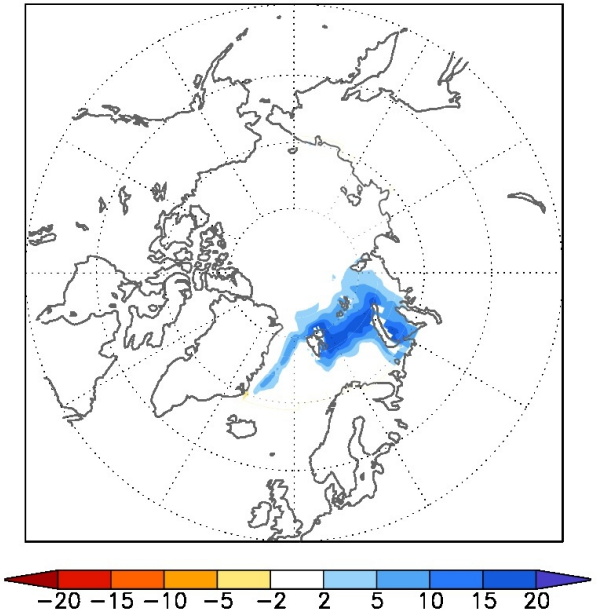

MCA(Feb,het,1st)

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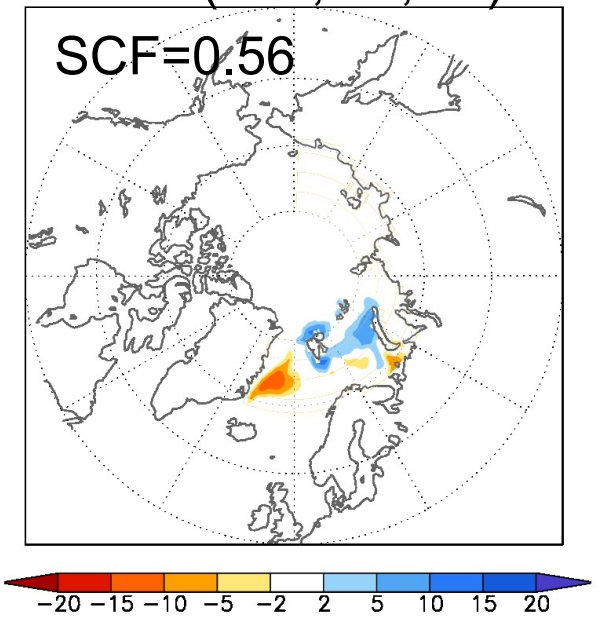

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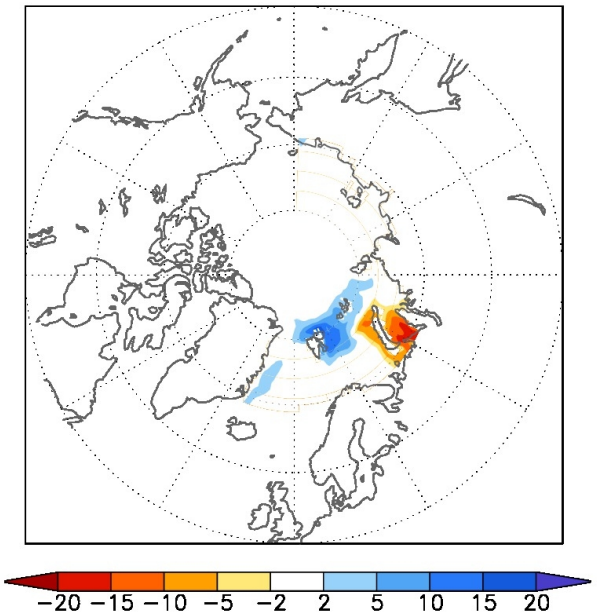

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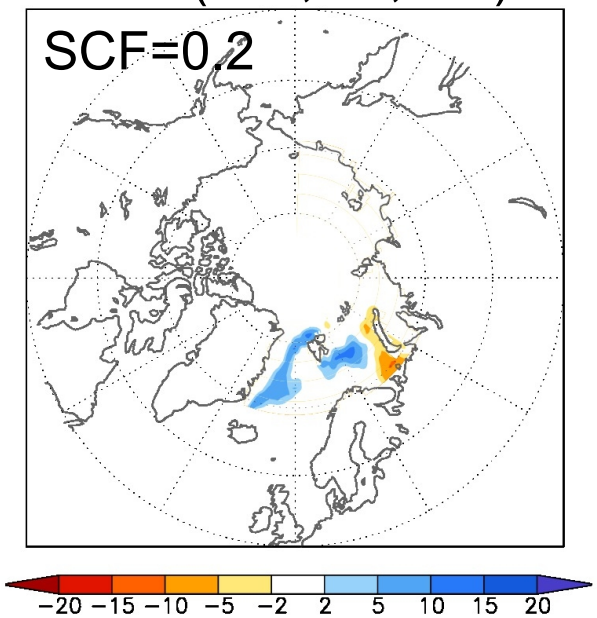
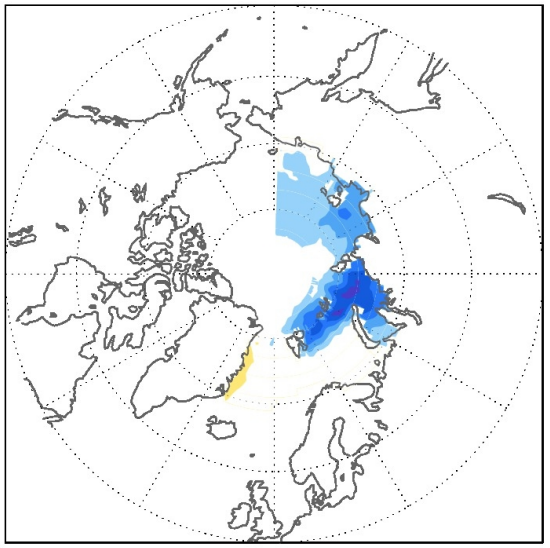
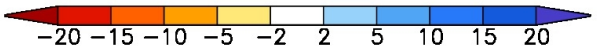


Reference SIC: Nov

First two MCA modes between SIC fields

MCA(Oct,hom,1st)





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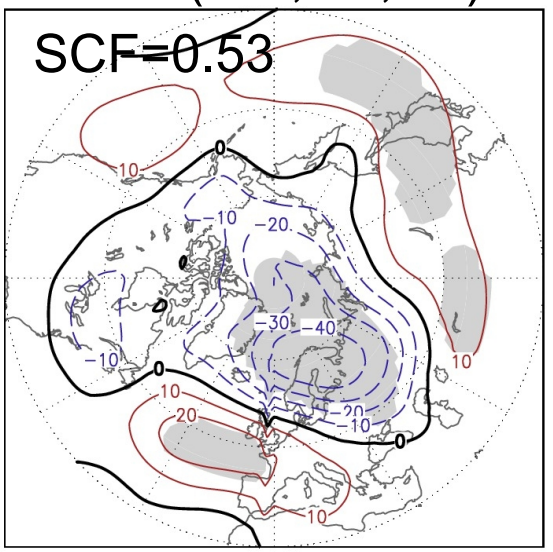

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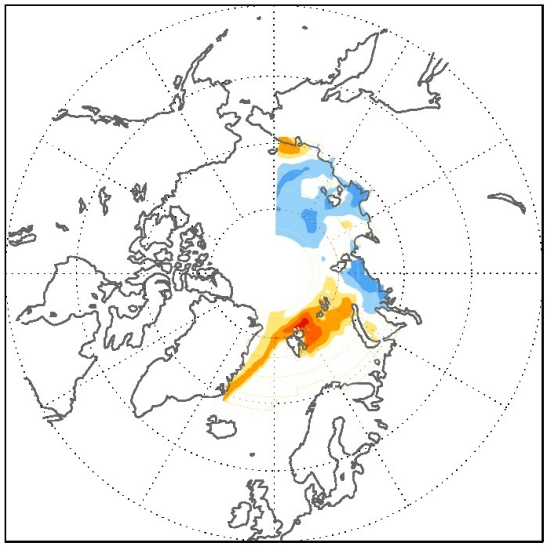

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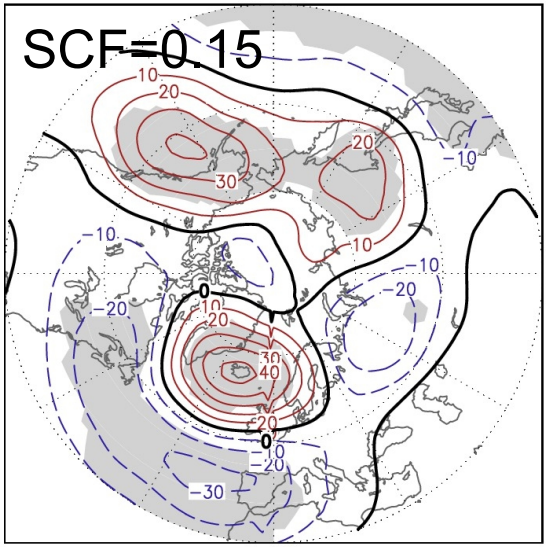
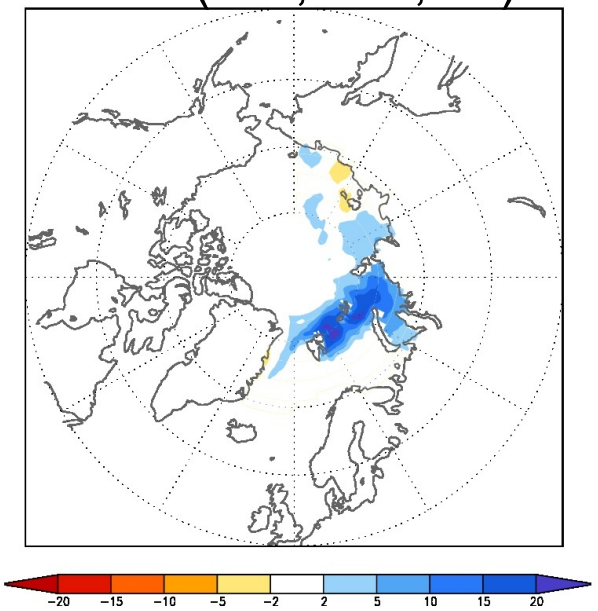


Reference SIC: Oct

First two MCA modes between SIC and Z500

MCA(Oct,hom,1st)



MCA(Nov,het,1st)

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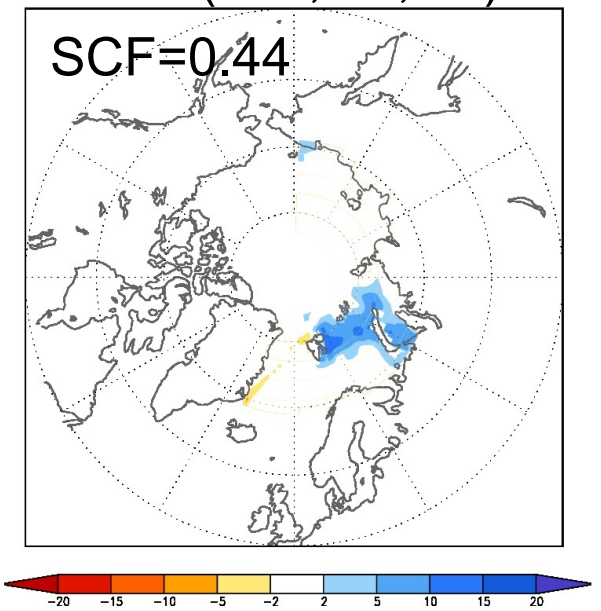

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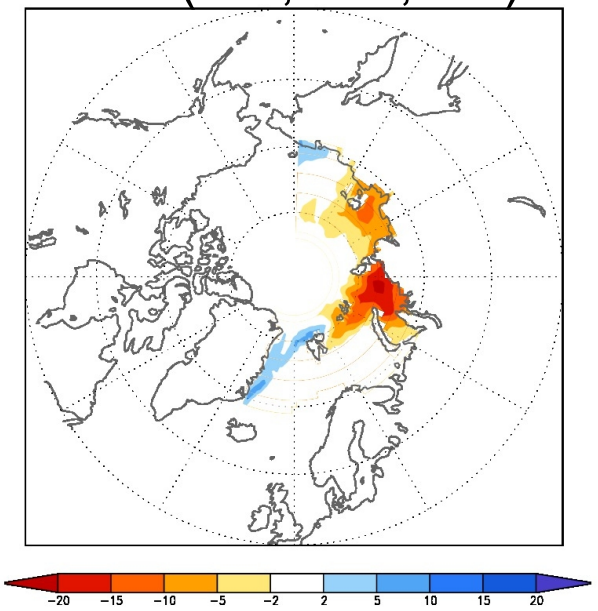

MCA(Nov,het,2nd)

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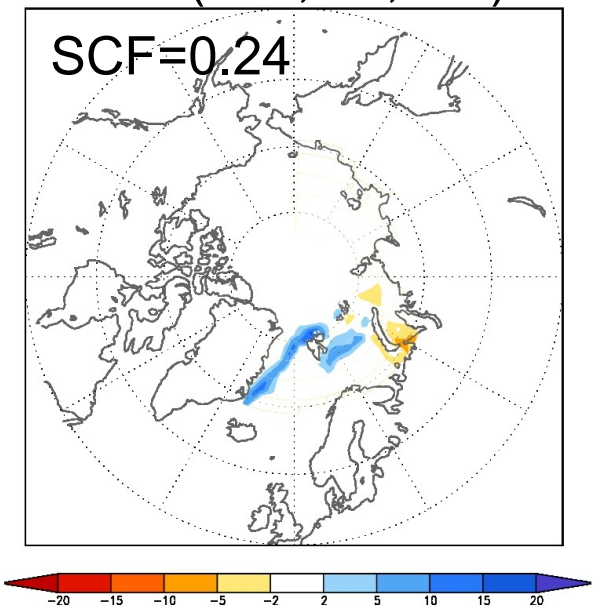
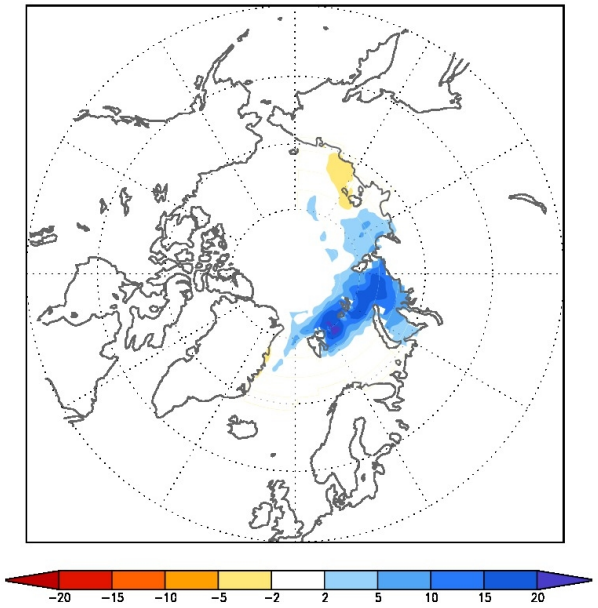


Reference SIC: Oct

First two MCA modes between SIC fields

MCA(Oct,hom,1st)



MCA(Dec,het,1st)

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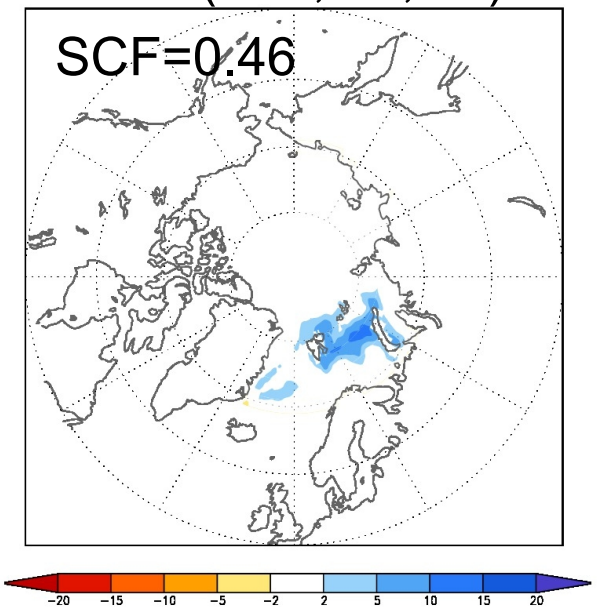

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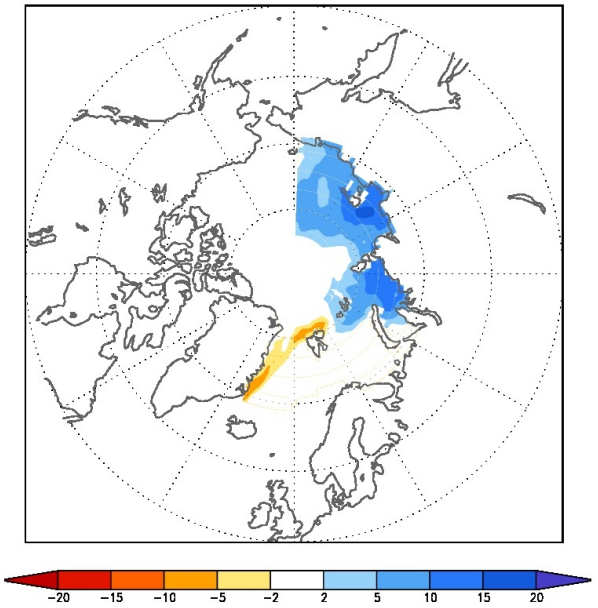

MCA(Dec,het,2nd)

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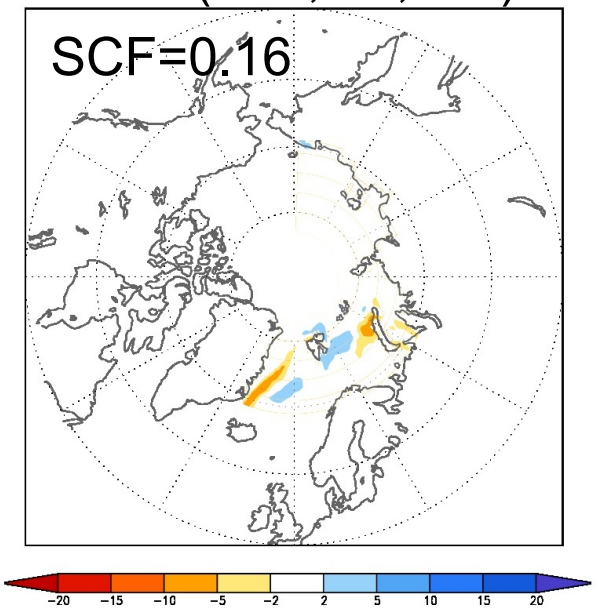
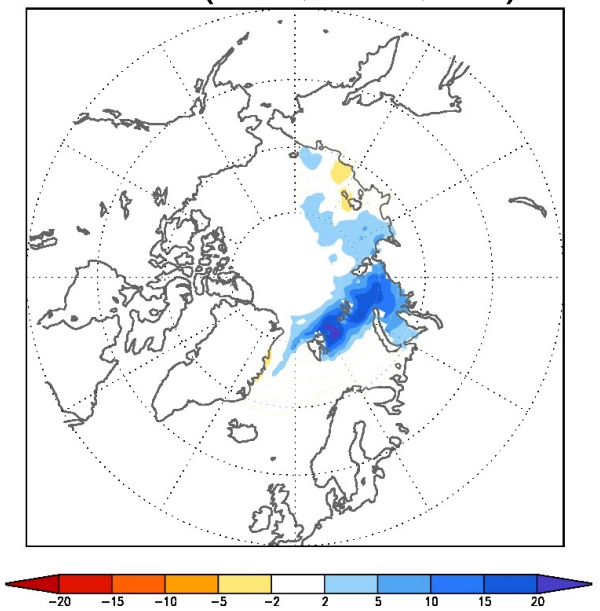


Reference SIC: Oct

First two MCA modes between SIC fields

MCA(Oct,hom,1st)



MCA(Jan,het,1st)

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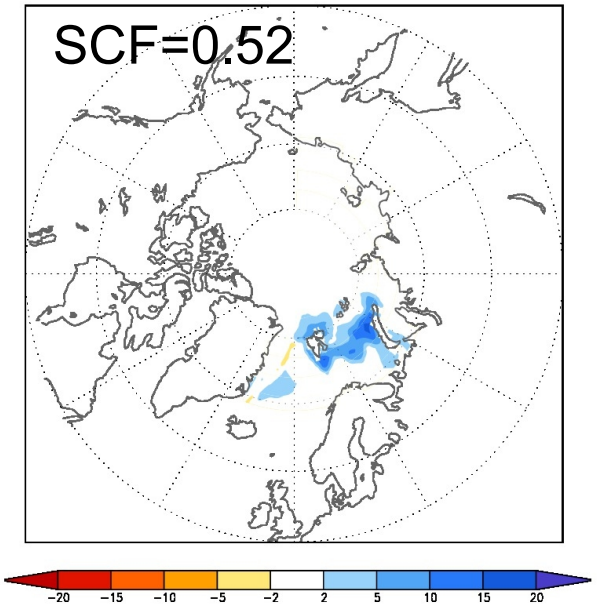
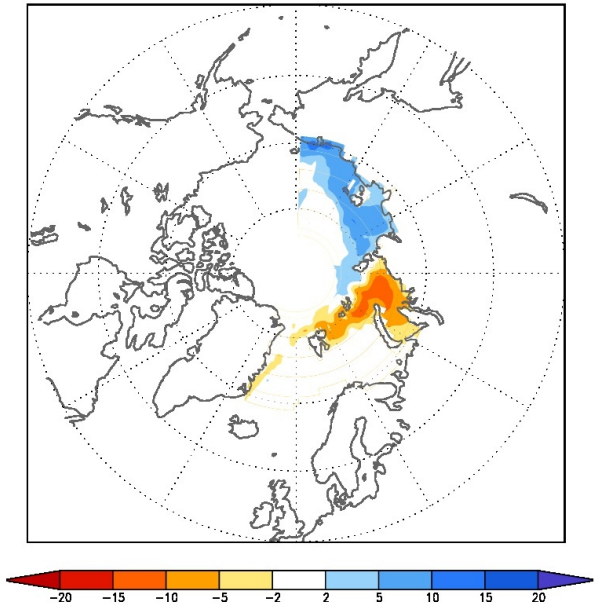


Reference SIC: Oct

First two MCA modes between SIC fields

MCA(Oct,hom,2nd)



MCA(Jan,het,2nd)

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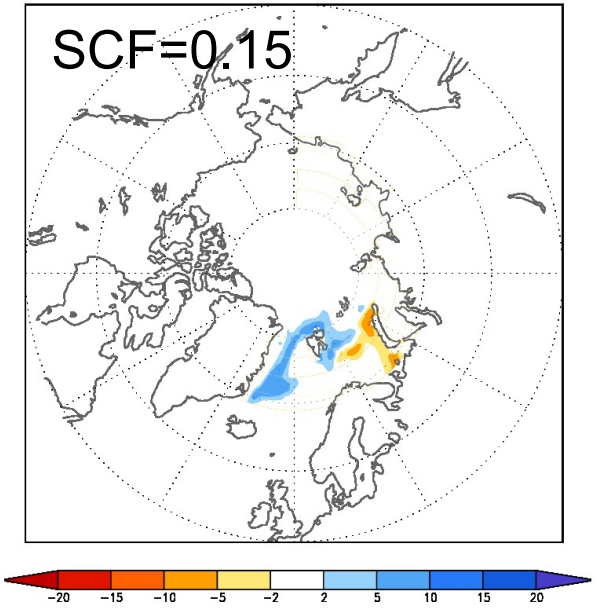
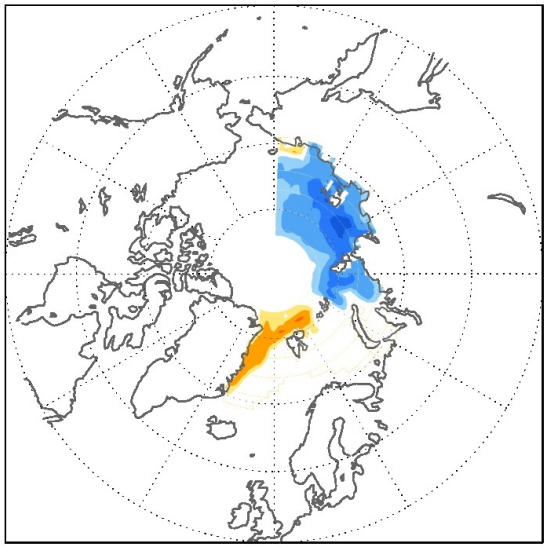


MCA(Sep,hom,1st)



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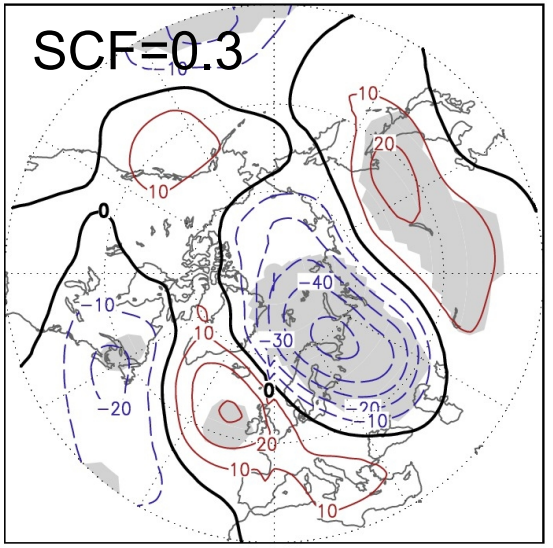

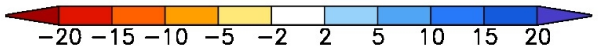

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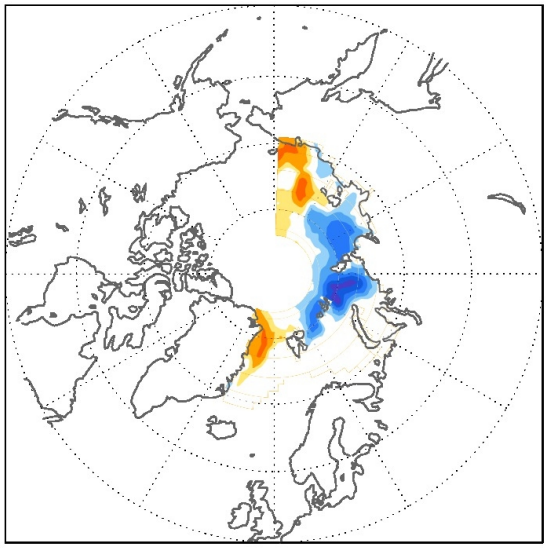

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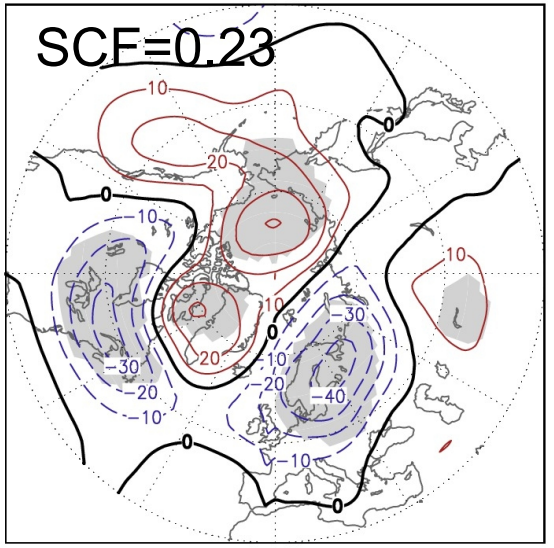
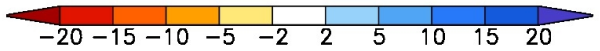
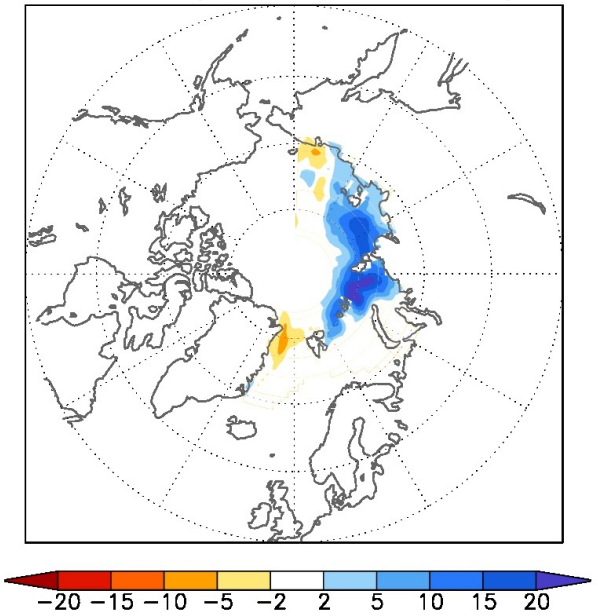




Reference SIC: Sep

First two MCA modes
between SIC and Z500

MCA(Sep,hom,1st)



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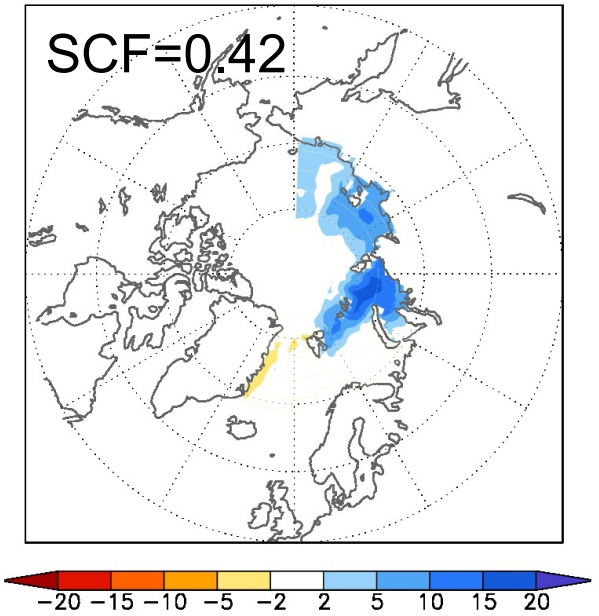

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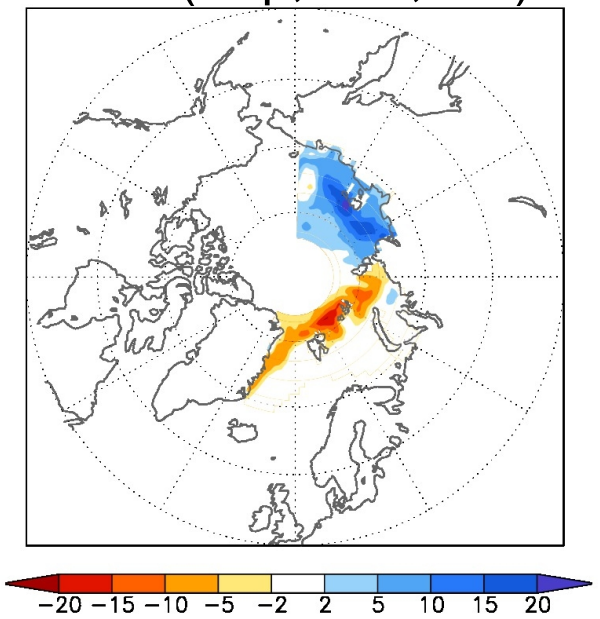

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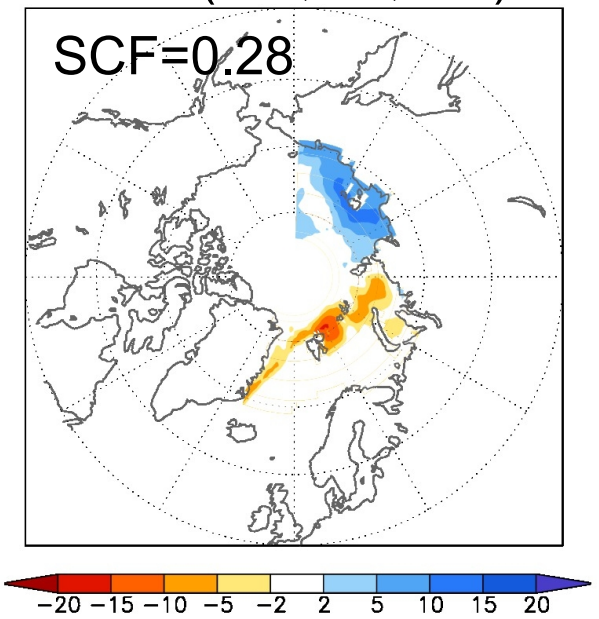
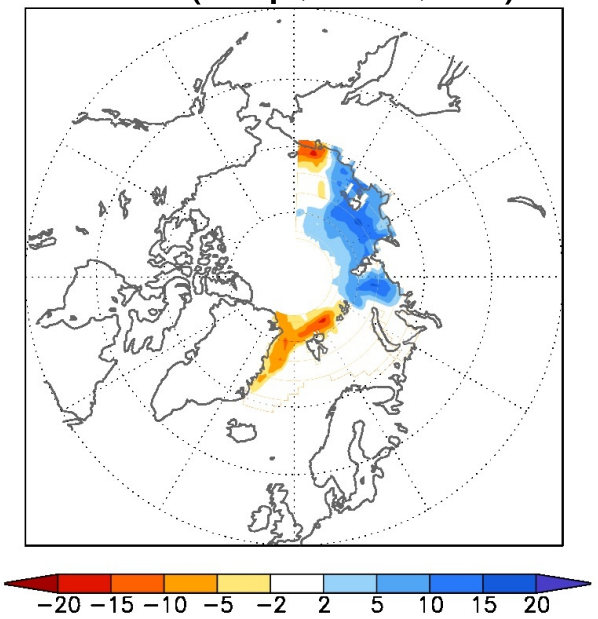


Reference SIC: Sep

First two MCA modes between SIC fields

MCA(Sep,hom,1st)



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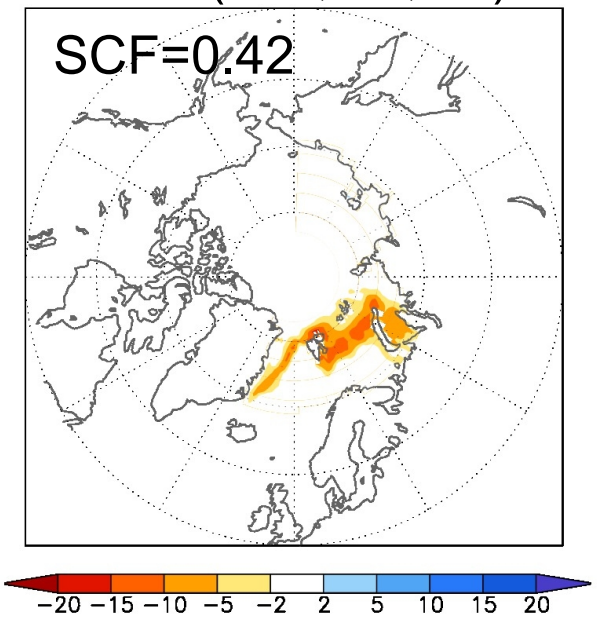

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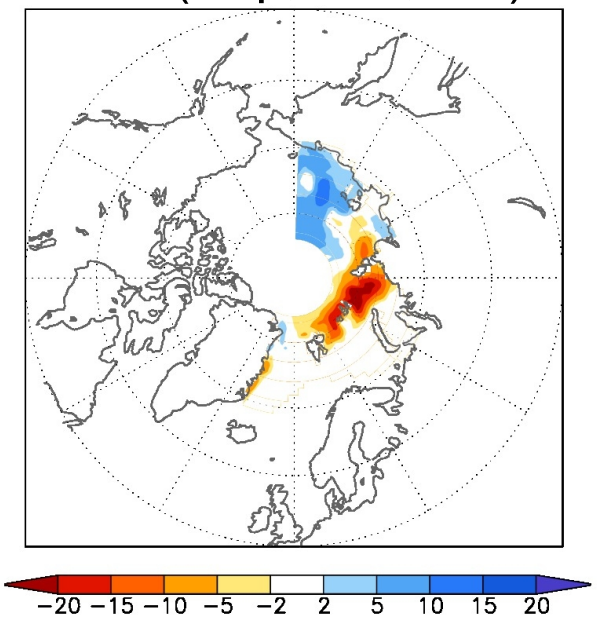

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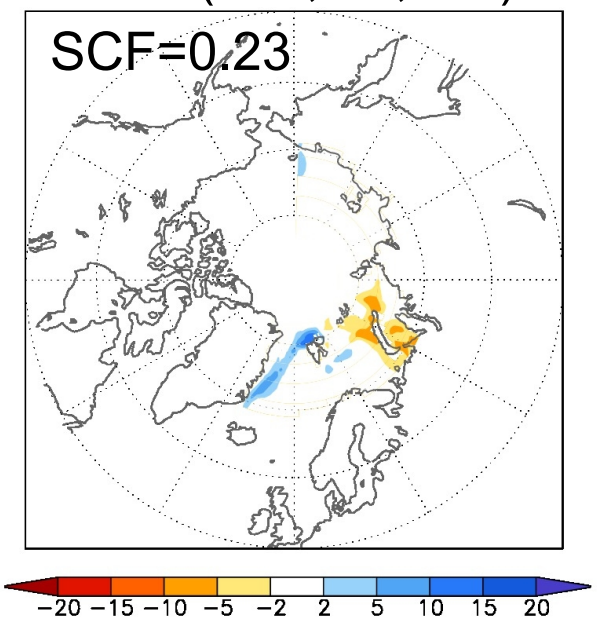
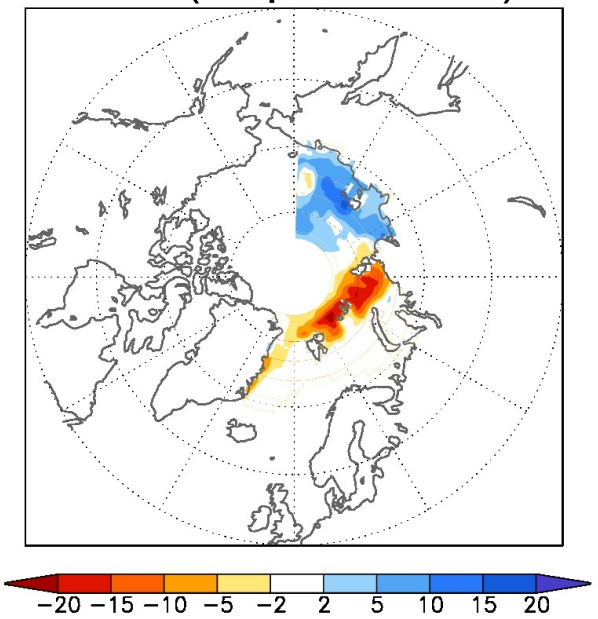


Reference SIC: Sep

First two MCA modes between SIC fields

MCA(Sep,hom,1st)



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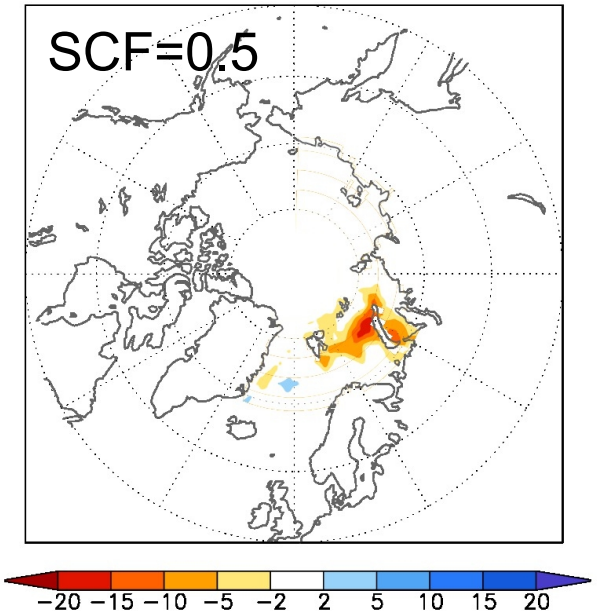

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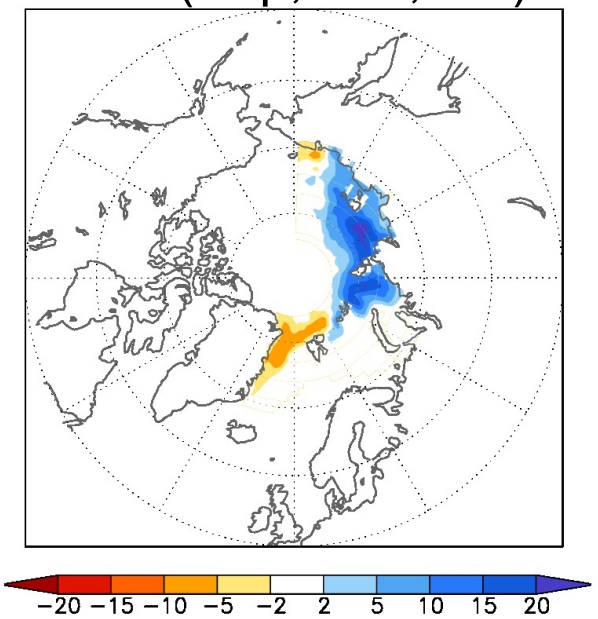

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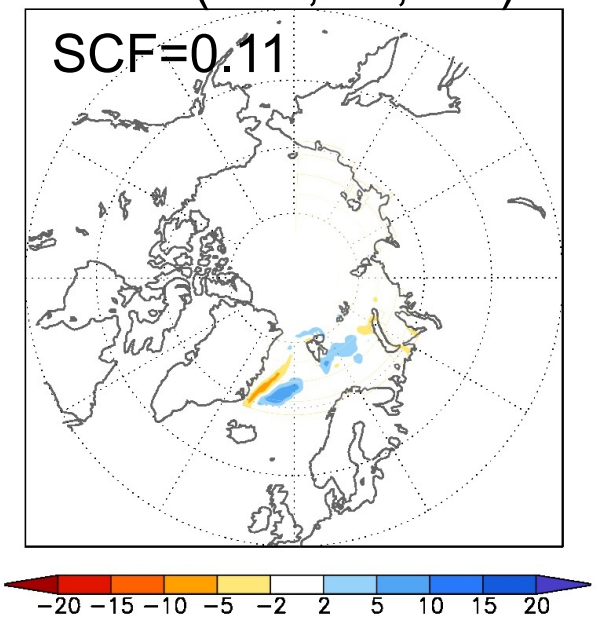
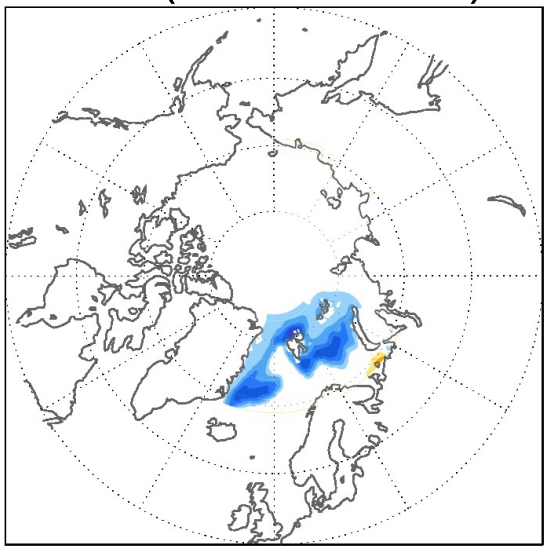


Reference SIC: Sep

First two MCA modes between SIC fields

MCA(Jan,hom,1st)



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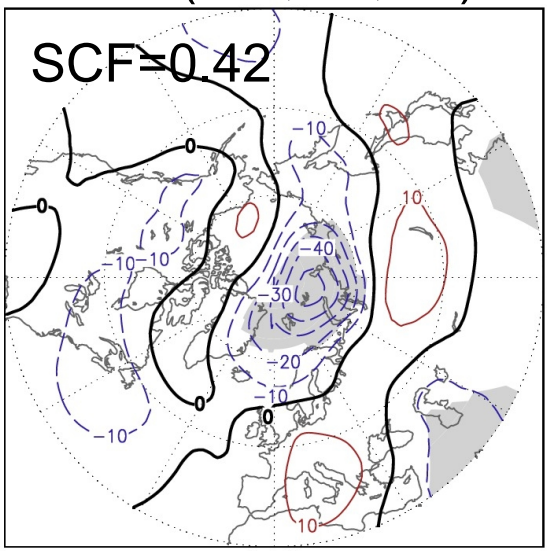
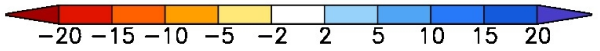
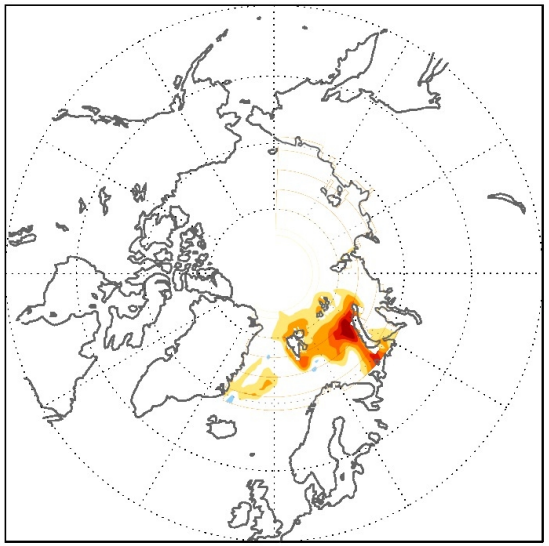
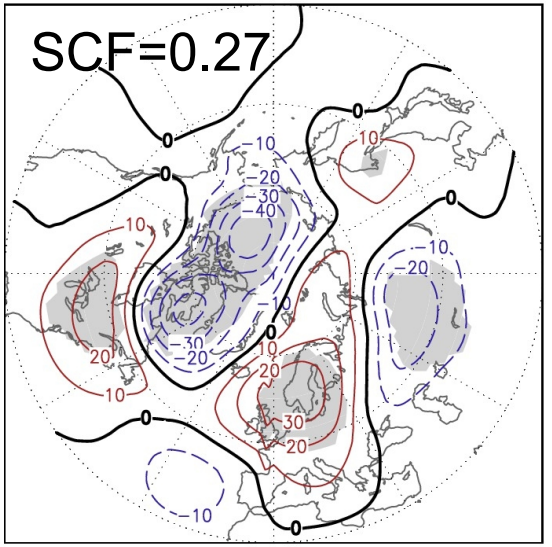


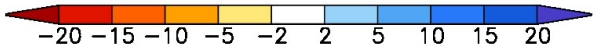


MCA(Jan,hom,2nd)



MCA(Jan,het,2nd)

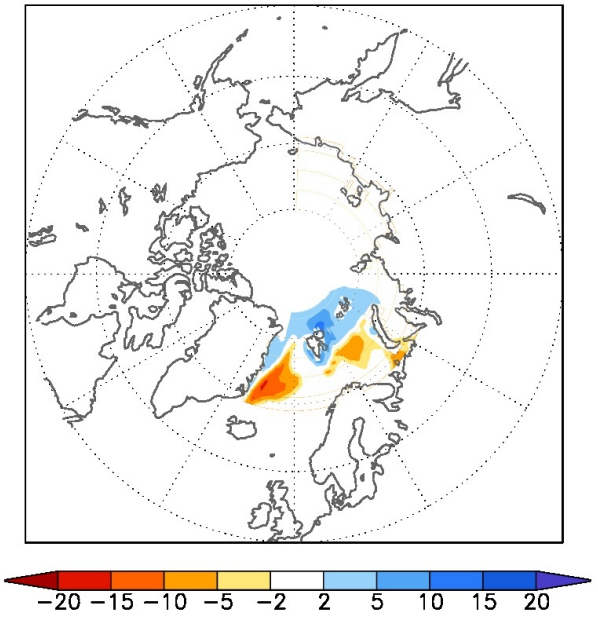




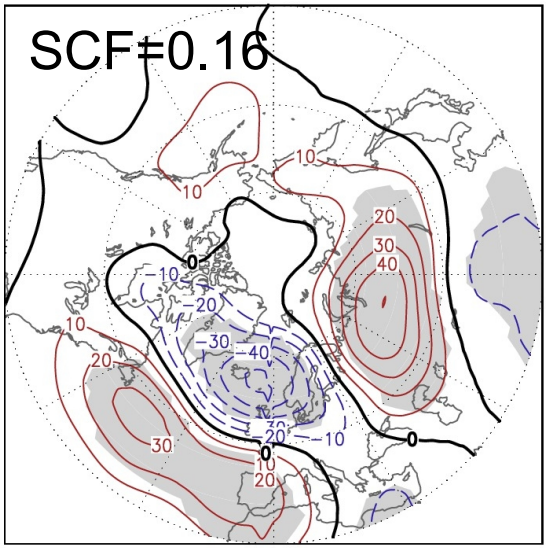
Reference SIC: Jan

First two MCA modes between SIC and Z500

MCA(Jan,hom,3rd)

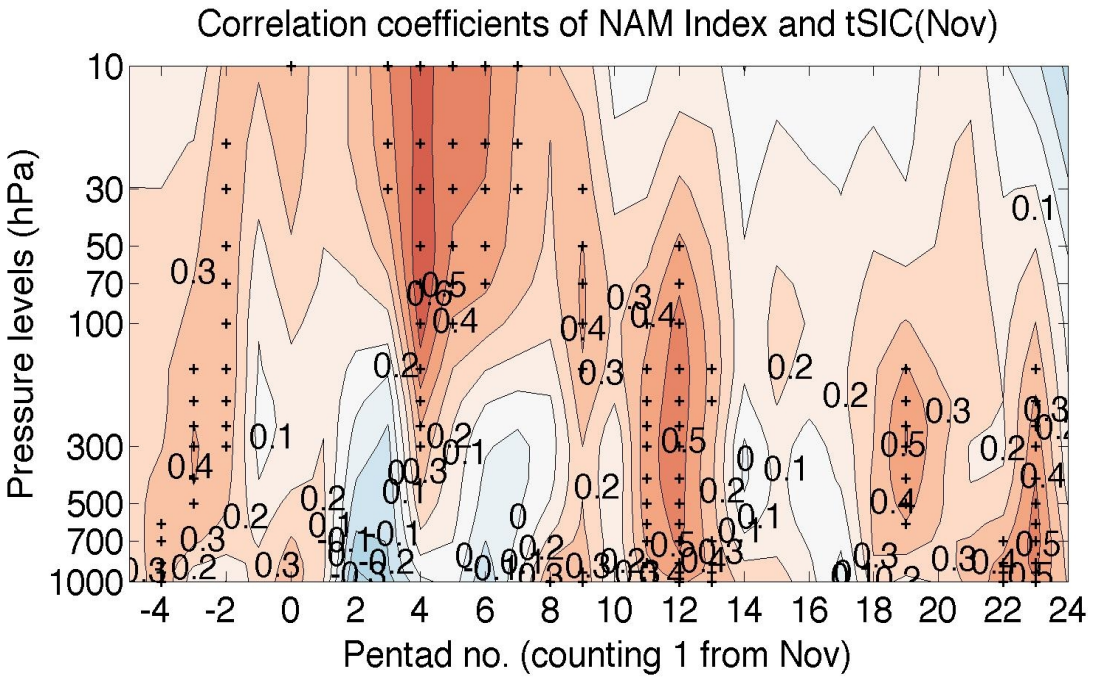


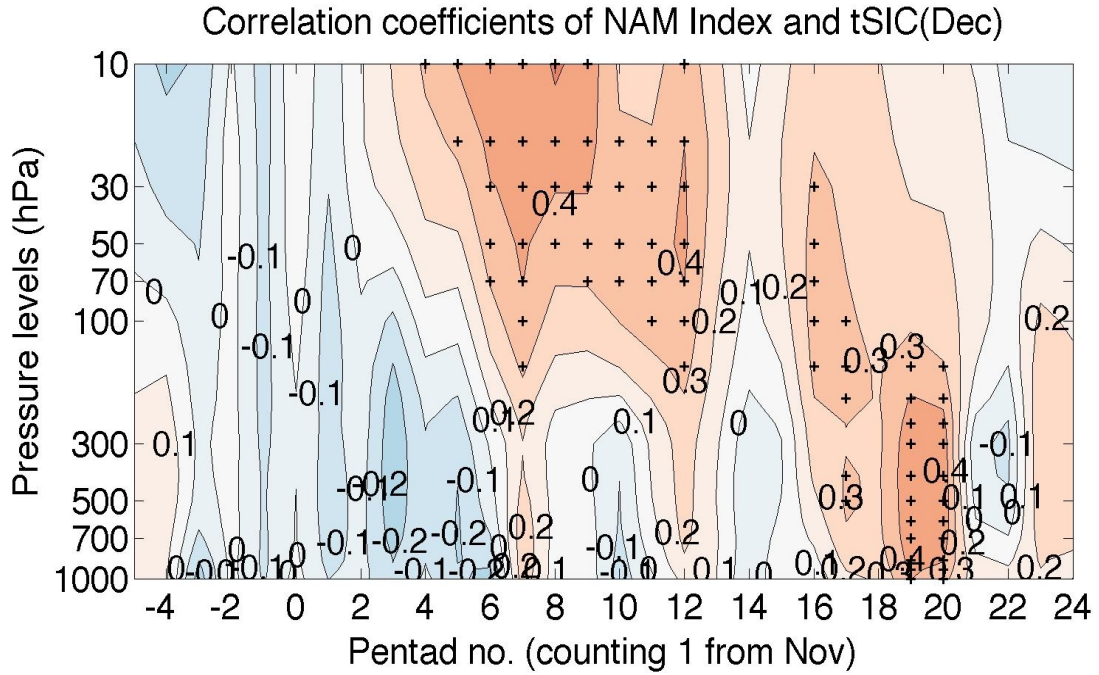
MCA(Jan,het,3rd)



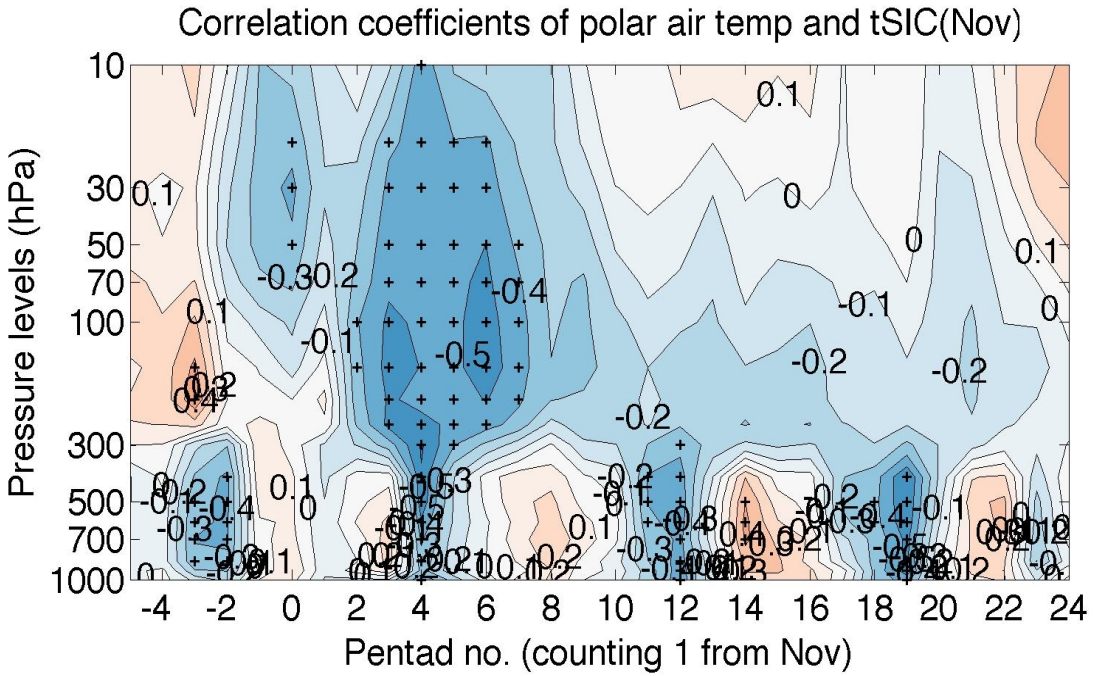
Reference SIC: Jan

MCA 3rd mode between SIC and Z500

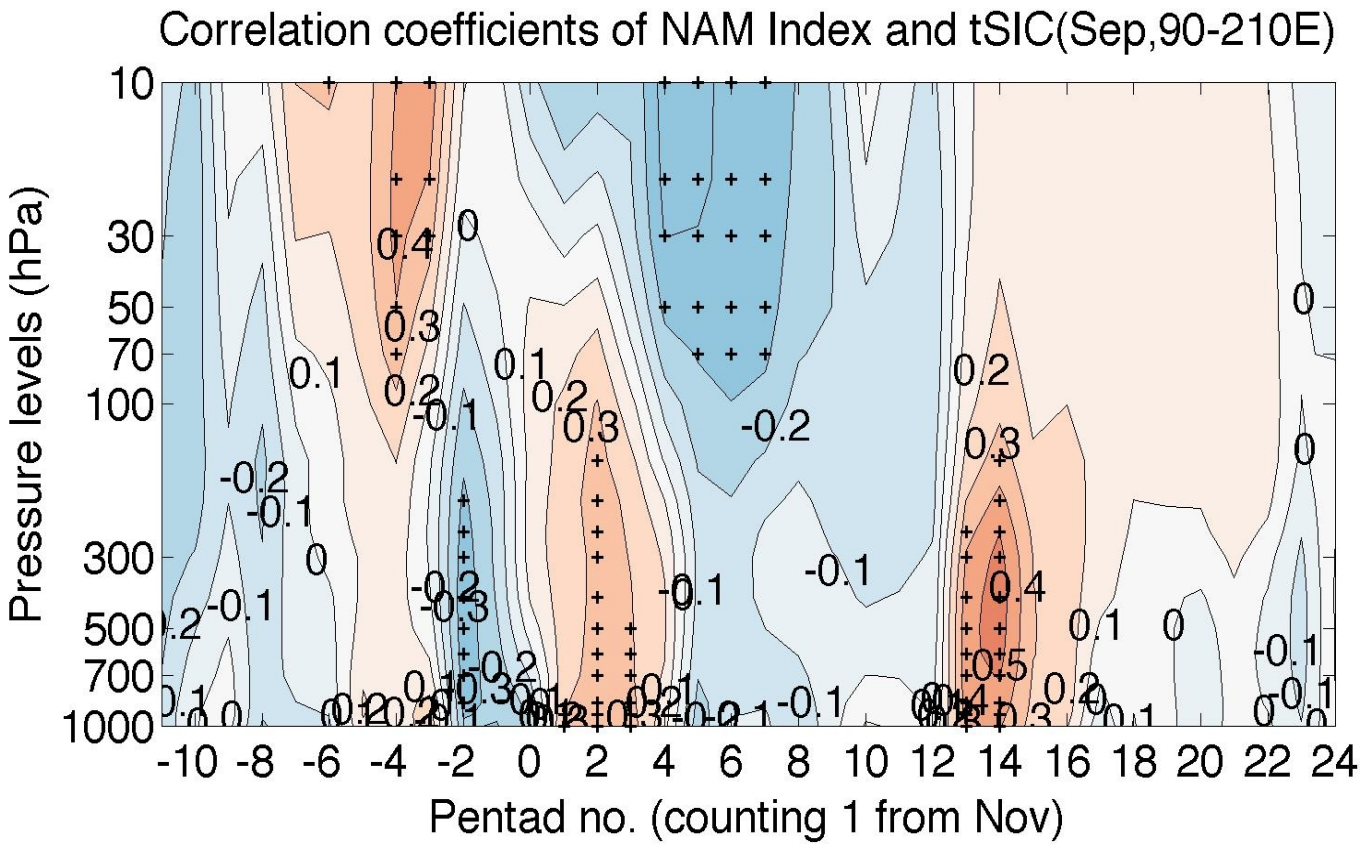




NAM index here is calculated as the normalised area-averaged geopotential heights in the zonal band of 40°-60°N minus the same of 70°-90°N, on 5-day (pentad) mean data.

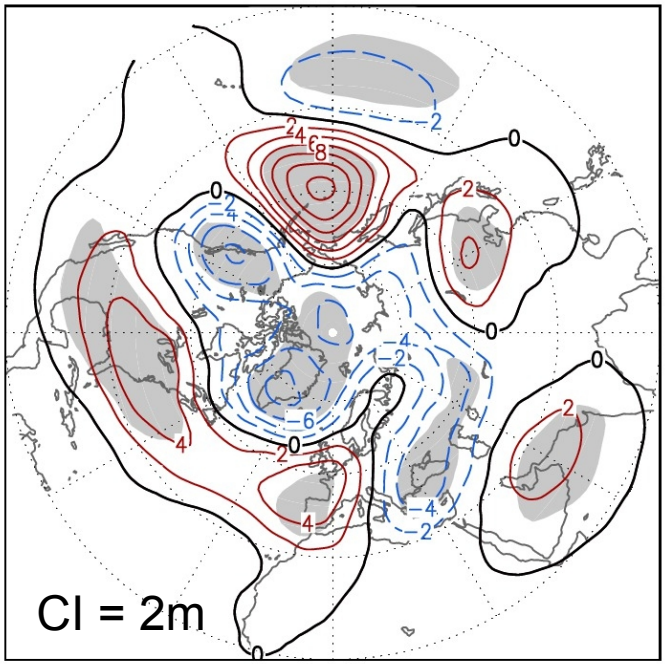


Polar air temperature is calculated as the area-averaged air temperature poleward of 70°N, on 5-day (pentad) mean data.

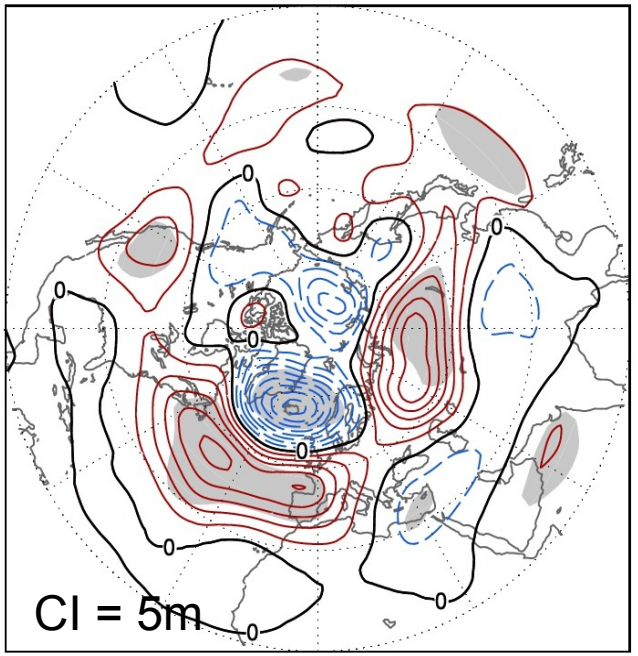

Correlation coefficients of NAM Index and tSIC(Sep,90-210E)
Pressure levels (hPa)
10
30
50
70
100
300
500
700
1000
-10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20 22 24
Pentad no. (counting 1 from Nov)

ECHAM5 Hightop Coupled Model Control experiment.
Top level at 0.01hPa, and L39, T63 resolutions

REG[Z500(Jan),tSIC(Nov)]



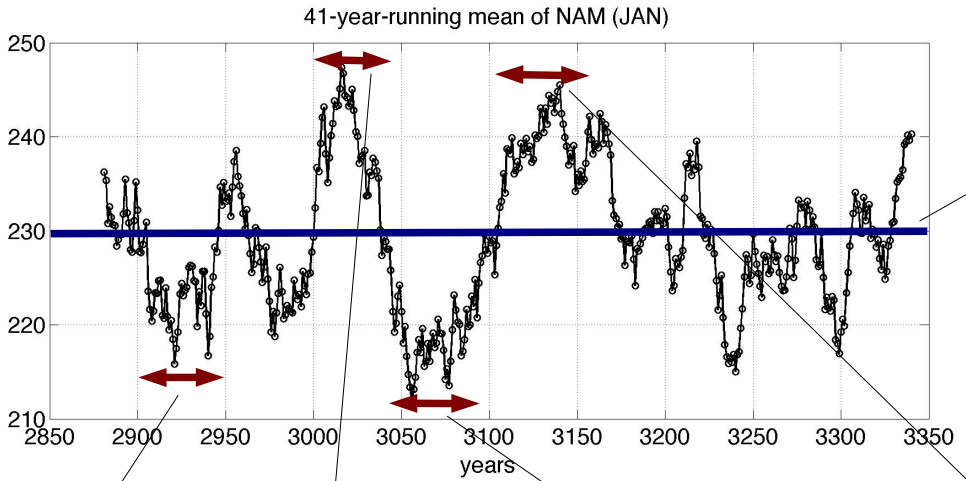
REG[Z500:Jan,tSIC:Nov]



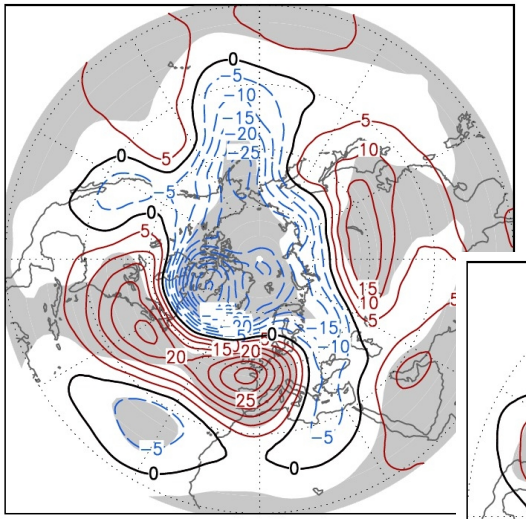
For the total run: 2862 - 3366

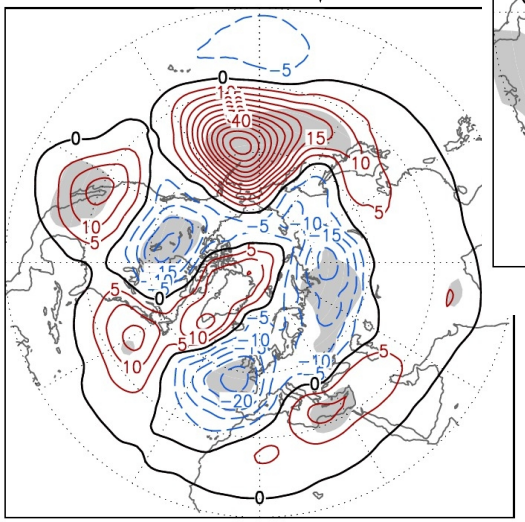
NCEP/NCAR and NSIDC

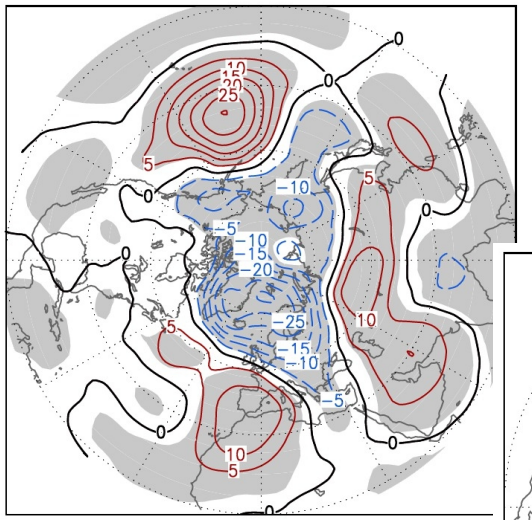
ECHAM Hightop

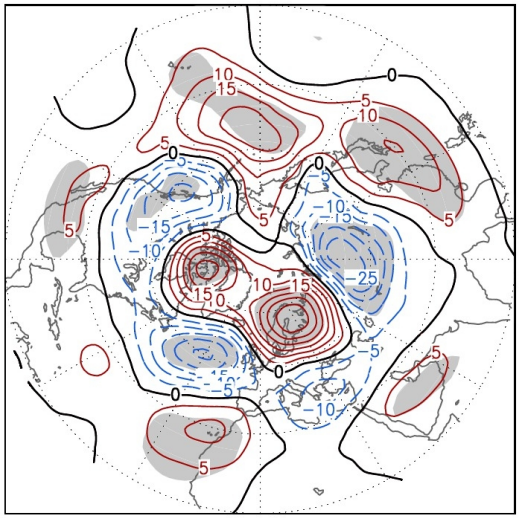


mean





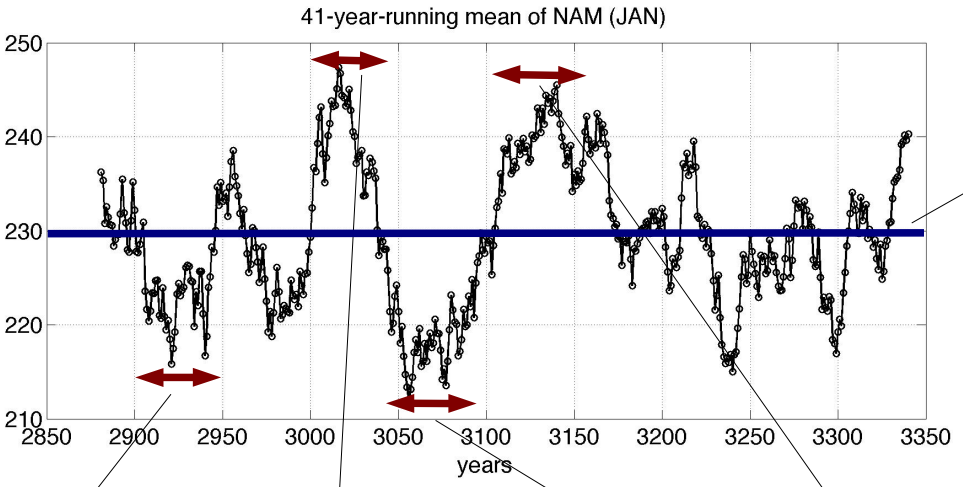




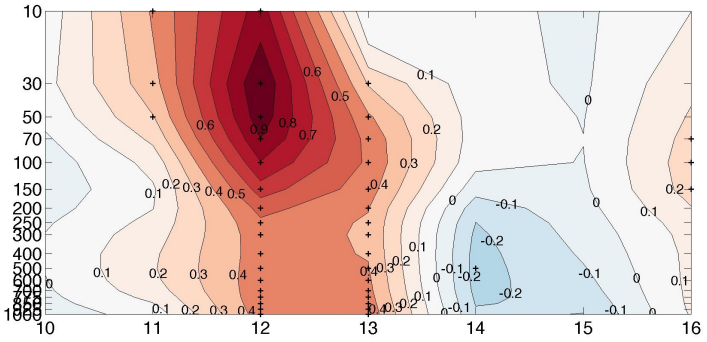
CI = 5m

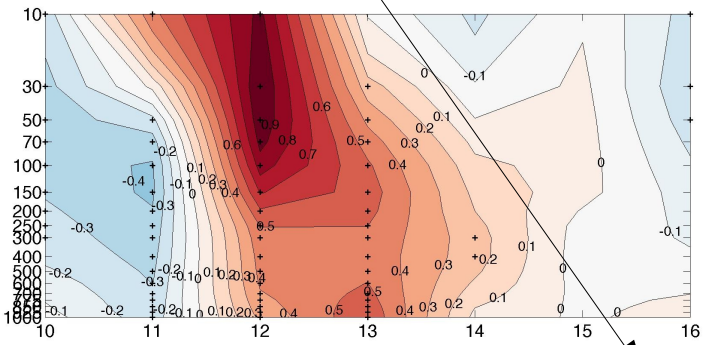
REG[Z500(Jan),tSIC(Nov)]. For 5-year-highpass filtered data

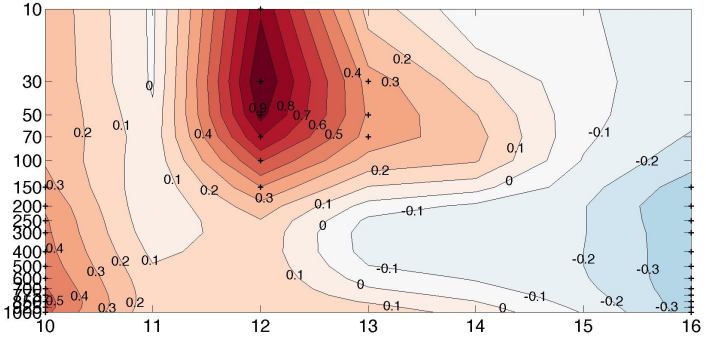
ECHAM Hightop

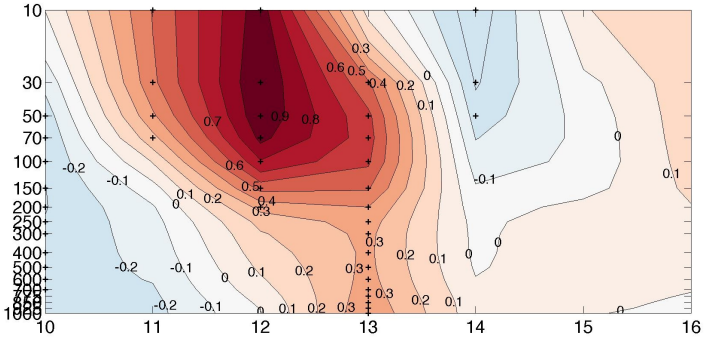


mean









CORR[NAM,NAM(Dec,30hPa)]. For 5-year-highpass filtered data

Points to consider:

1. Sea ice (surface forcings) persistence
2. Lagged feedbackS between atmosphere and sea ice (surface) forcings
3. The role of stratosphere
4. Dependence on background flow