

Blue Action

WP2.4 Progress

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by SURF & NWO

NLeSC WP2.4

- **Synthesis and dissemination of ocean and atmosphere heat transport to the Arctic**



Reanalysis



Reanalysis



- **ERA-Interim (ECMWF)**
- **MERRA2 (NASA)**
- **JRA55 (JMA)**


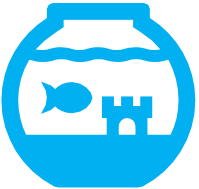


- **ORAS4 (ECMWF)**
- **GLORYS2V3 (Mercator Ocean)**
- **SODA3 (UM and TAMU)**



Reanalysis

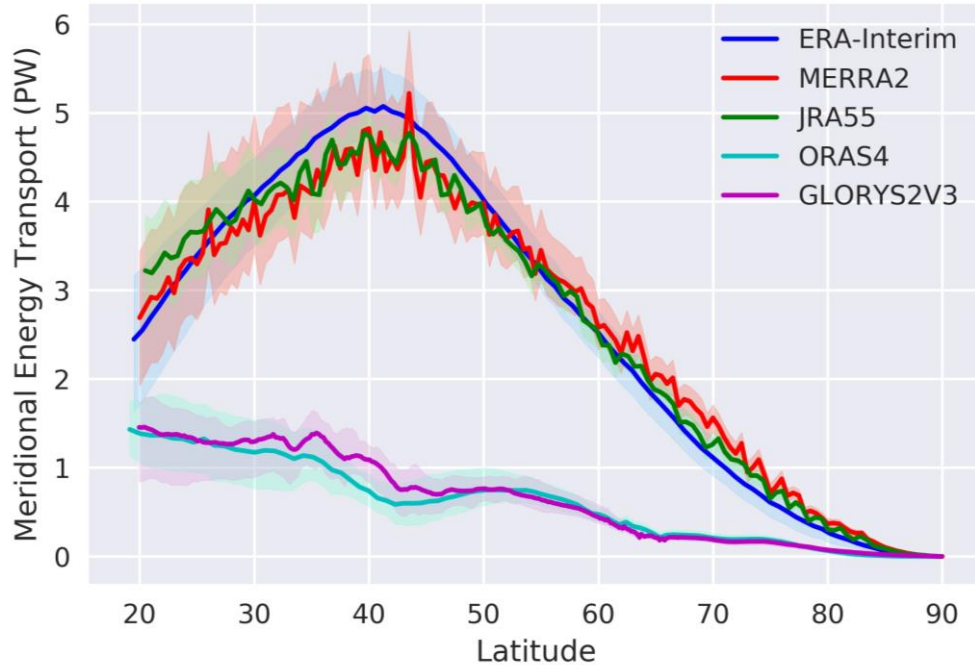


	<ul style="list-style-type: none">• ERA-Interim	1979 - 2016	6 hourly	0.75° x 0.75° x 60 lev
	<ul style="list-style-type: none">• MERRA2	1980 - 2016	3 hourly	0.5° x 0.667° x 70 lev
	<ul style="list-style-type: none">• JRA55	1979 - 2015	6 hourly	0.5625° x 0.5625° x 60 lev
	<ul style="list-style-type: none">• ORAS4	1958 - 2014	monthly	ORCA1
	<ul style="list-style-type: none">• GLORYS2V3	1993 - 2014	monthly	ORCA025
	<ul style="list-style-type: none">• SODA3	1980 - 2015	Per 5 days	MOM5



AMET & OMET

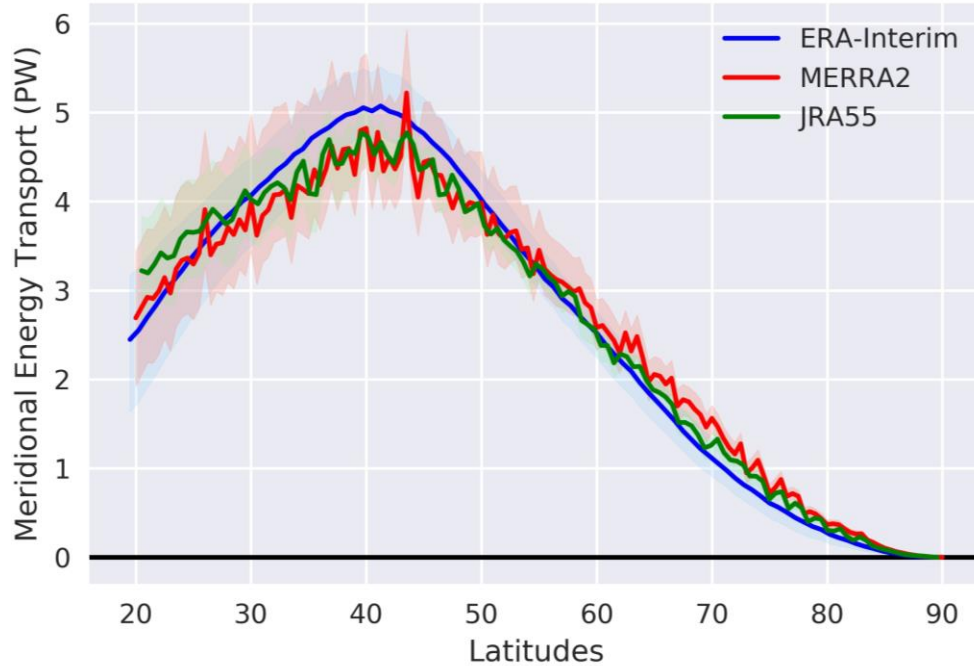
Mean AMET & OMET of entire time series from 20N to 90N



Mean AMET & OMET of entire time series from 20N to 90 N

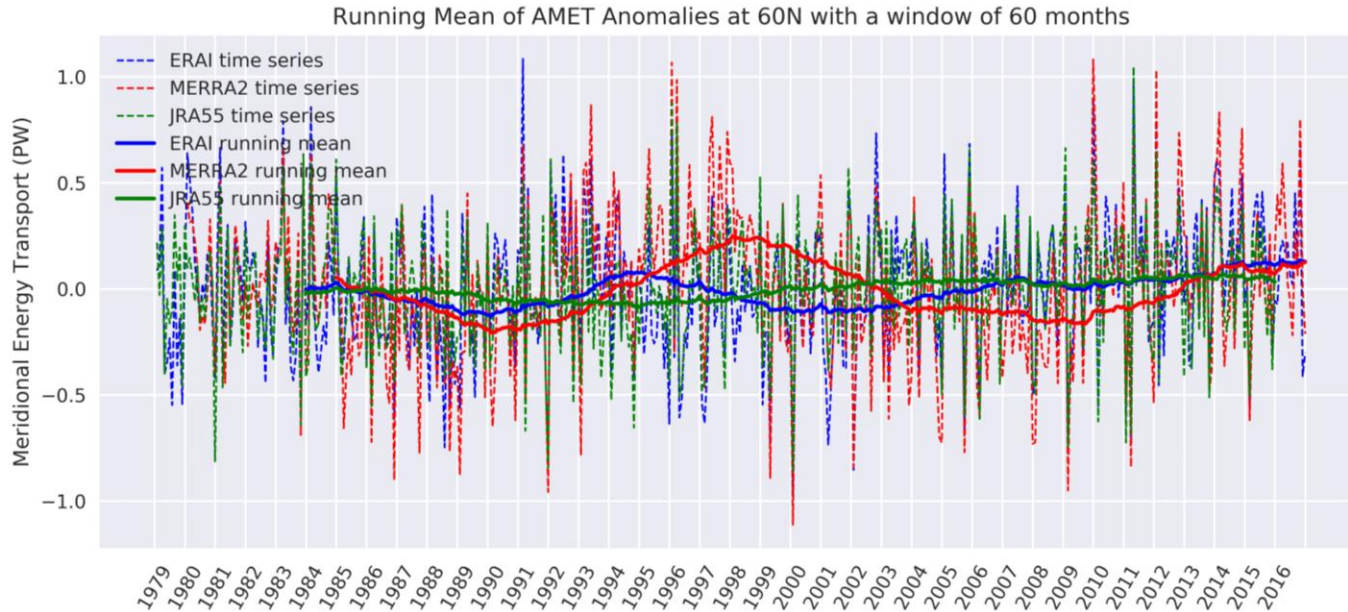
AMET

Mean AMET of entire time series from 20N to 90N



Mean AMET of entire time series from 20N to 90 N

AMET



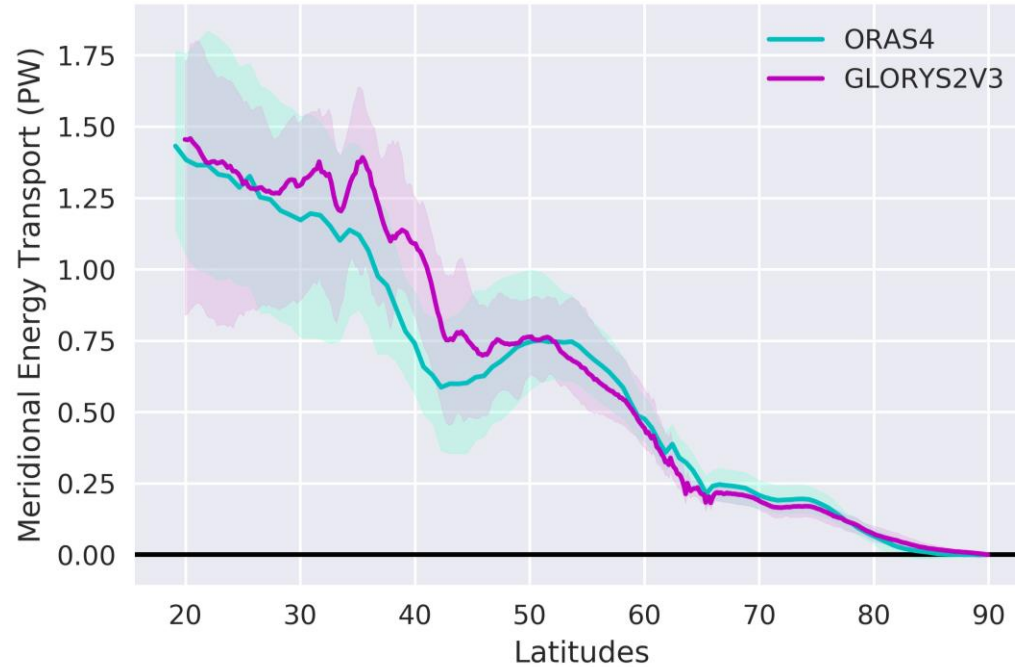
mean (ERA-Interim) = 0 PW
mean (MERRA2) = 0 PW
mean (JRA55) = 0 PW

std (ERA-Interim) = 0.3198 PW
std (MERRA2) = 0.3527 PW
std (JRA55) = 0.2857 PW

AMET anomalies and low pass filtered signals at 60 N

OMET

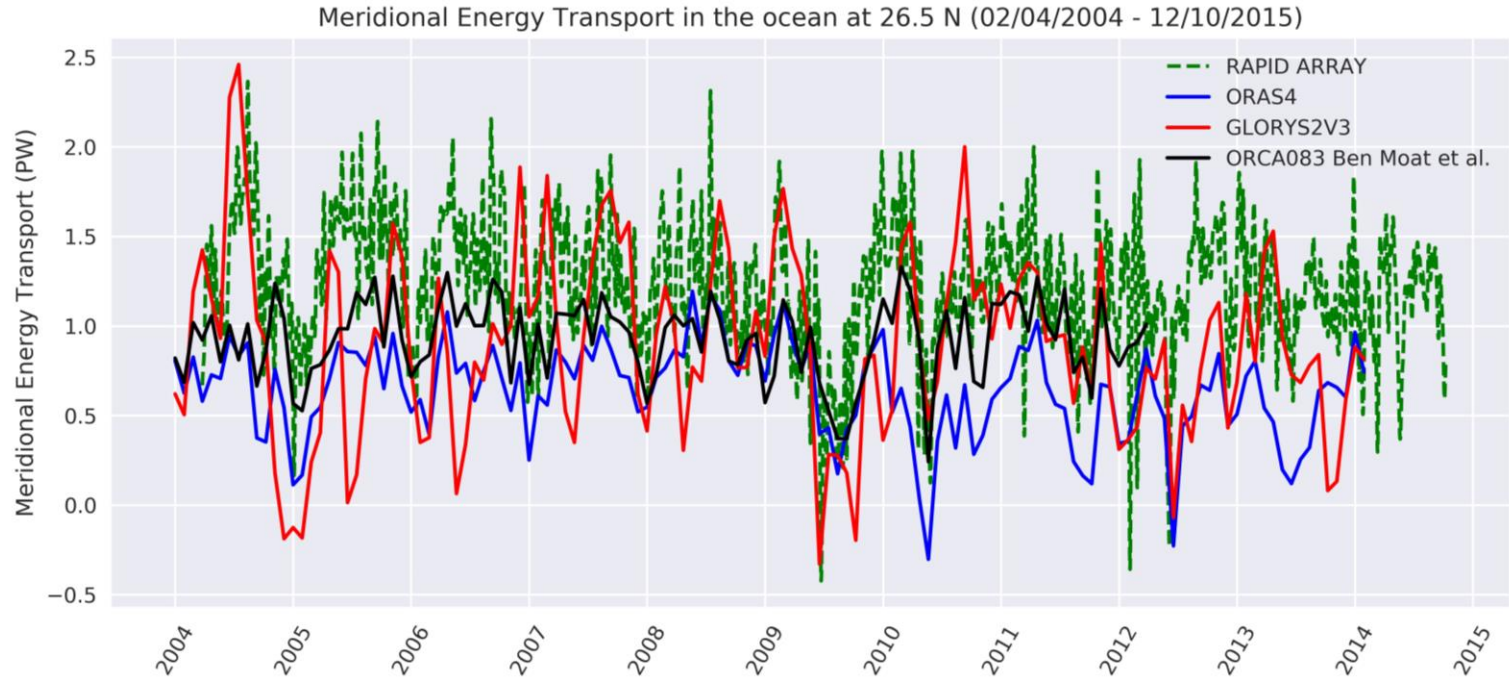
Mean OMET of entire time series from 90S to 90N



Mean OMET of entire time series from 20N to 90 N



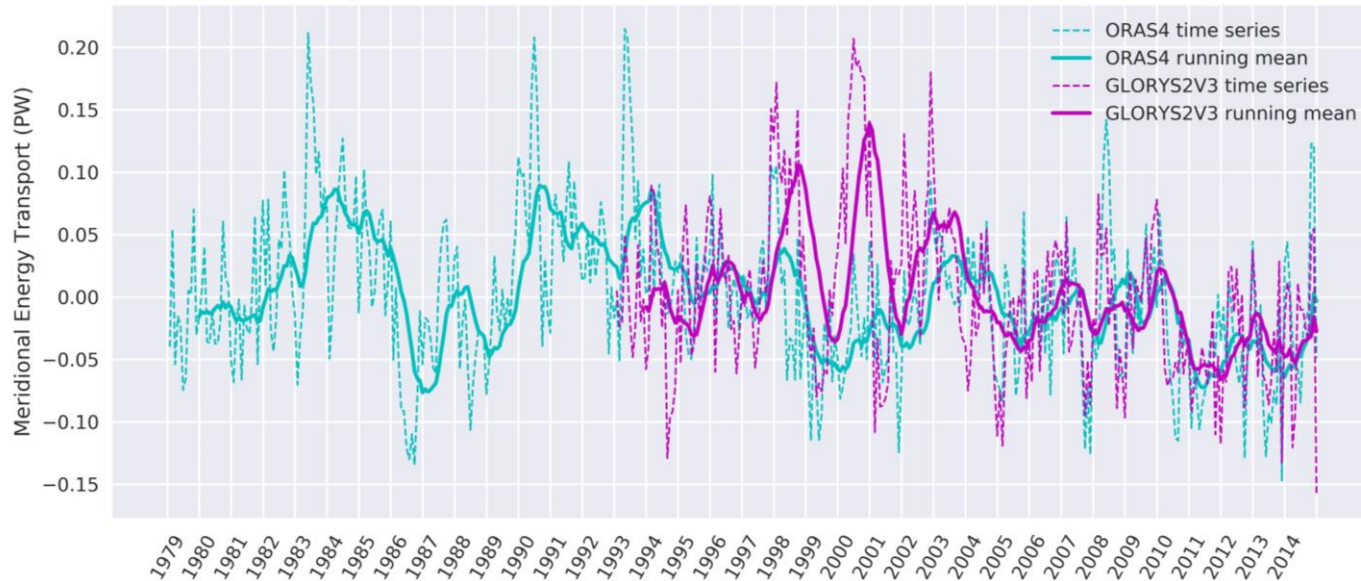
OMET vs. OBS & Hindcast



OMET and RAPID ARRAY obs. time series at 60 N

OMET

Running Mean of OMET Anomalies at 60N with a window of 12 months (1979-2014)



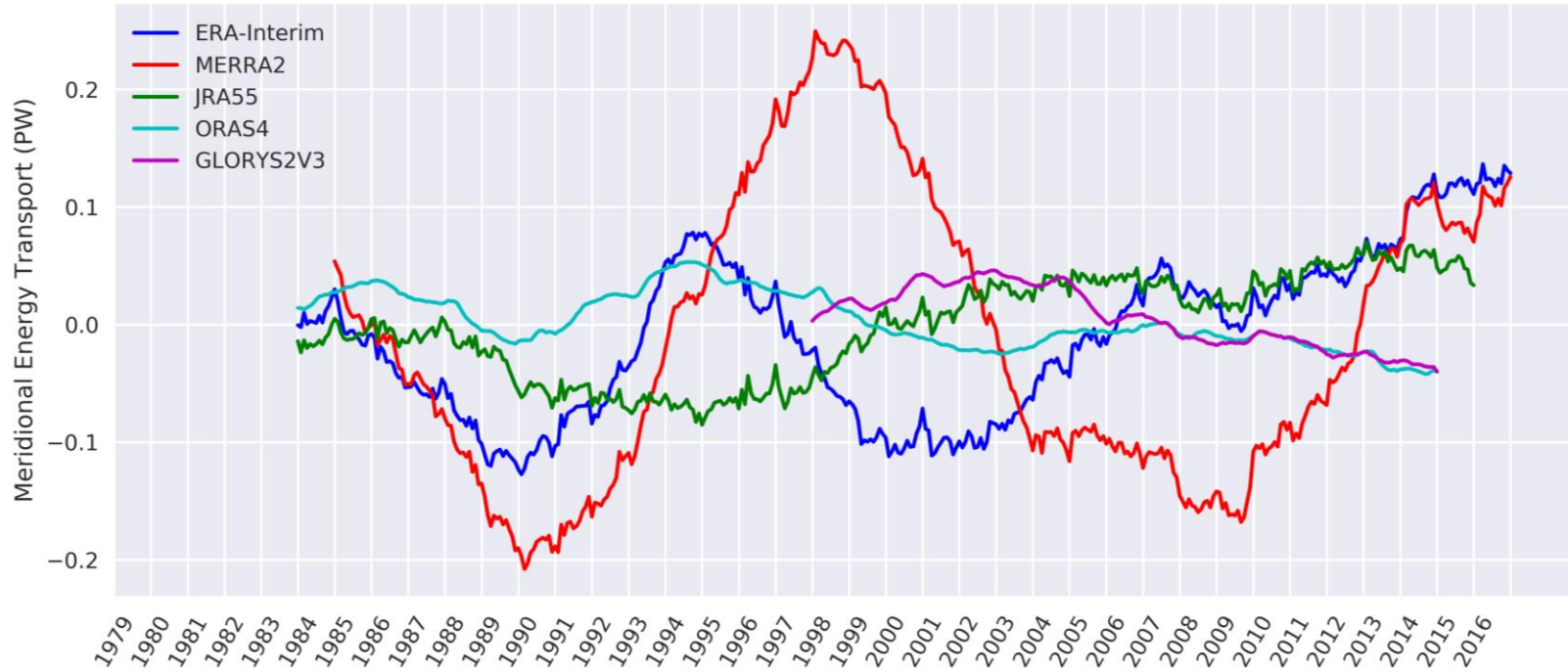
mean (ORAS4) = 0 PW
mean (GLORYS) = 0 PW

std (ORAS4) = 0.0602 PW
std (GLORYS) = 0.0652 PW

OMET anomalies and low pass filtered signals at 60 N

AMET & OMET

Meridional Energy Transport Anomalies with running mean of 60 months at 60 N



AMET & OMET anomalies with a running mean of 5 years

Conclusion

- The mean heat transports in all datasets agree well
- However, the spatial distribution and temporal variation of AMET & OMET, deviate substantially
- The difference between atmospheric reanalysis products mainly lies in the temperature transport
- GLORYS2V3 agrees well with the RAPID ARRAY, compared with ORAS4



Reference

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Thank you

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