A Microwave Satellite Application: Polar influences on the diverse nature of South and East Asian Summer Monsoons

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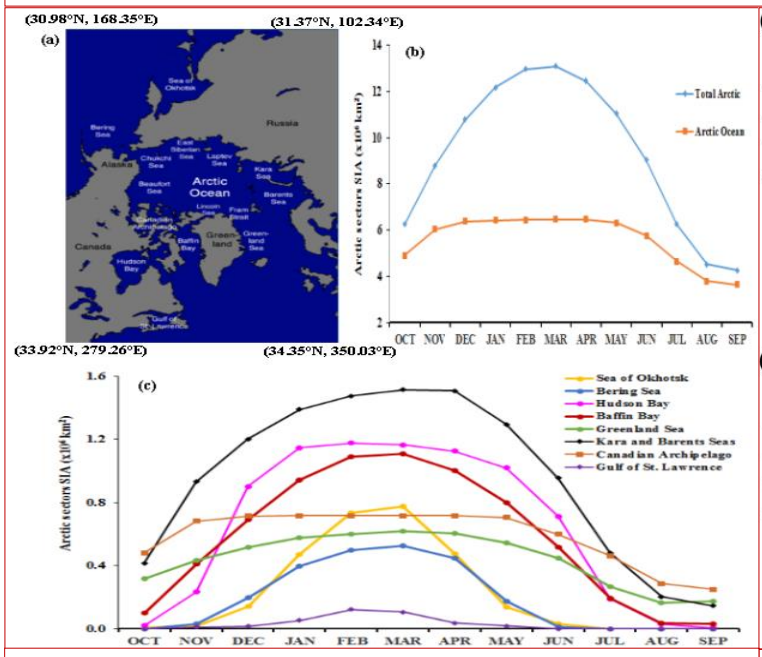
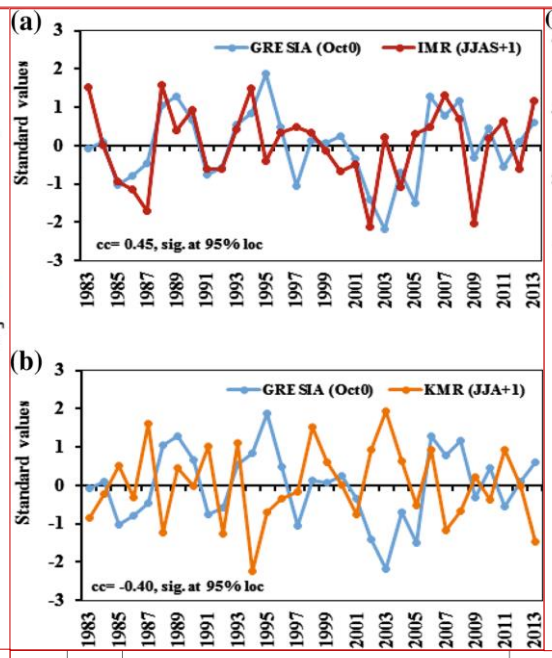
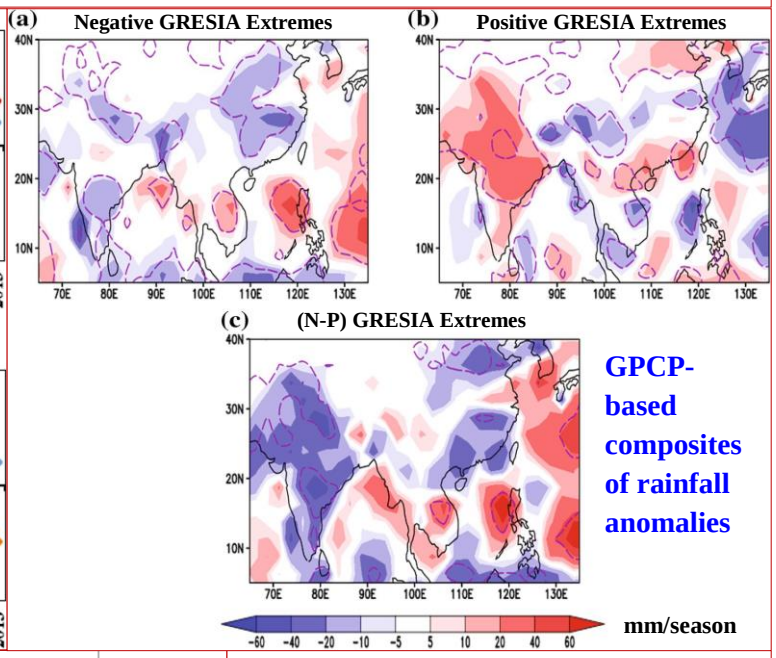
***Amita Prabhu**, J. Oh, I-w Kim, R. H. Kripalani and **G. Pandithurai** (2017) SMMR-SSM/I derived Greenland Sea ice variability: links with Indian and Korean Monsoons, **Climate Dynamics**, DOI: 10.1007/s00382-017-3659-0*

Objective of this study: Using passive microwave satellite SMMR-SSM/I data, we attempt to determine a unique predictor that could jointly presage the summer monsoon rainfall over India and Japan-Korean peninsula, a season or two in advance.

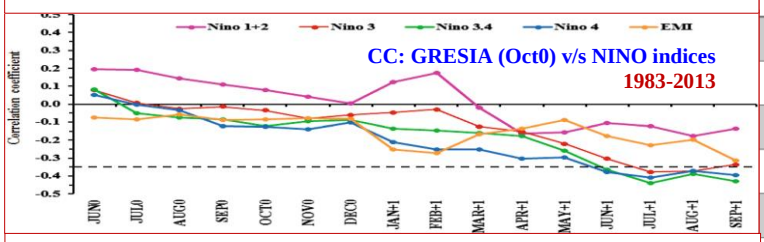




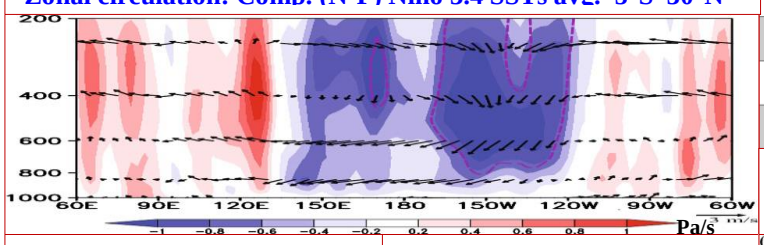


GPCP-based composites of rainfall anomalies

Physical mechanism 1: possible route for GRESIA through Pacific SSTs

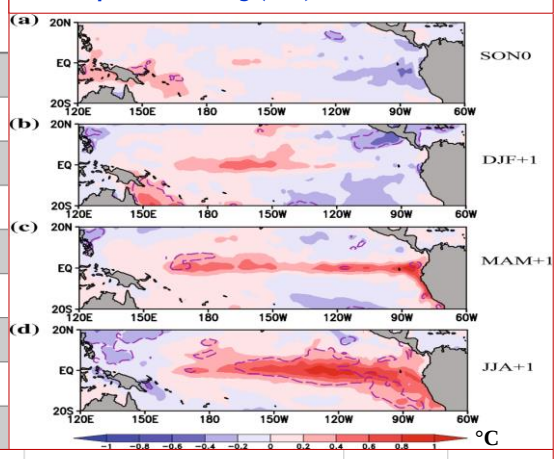


Zonal circulation: Comp. (N-P) Niño 3.4 SSTs avg. 5°S–30°N

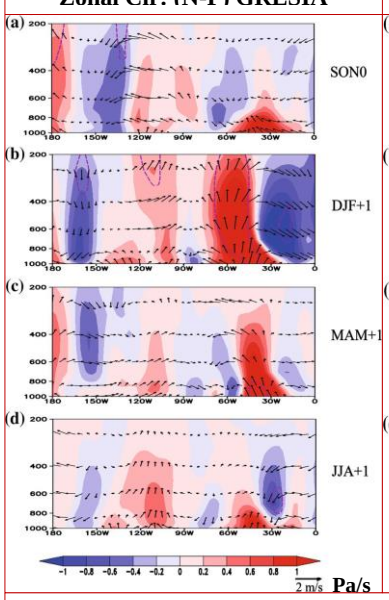


Set No.	Sr. No.	Correlation for the period 1983-2013	Correlation coefficient	Significance
I	1	GRESIA and IMR	0.45	95% loc
	2	ENSO and IMR	-0.42	95% loc
	3	GRESIA and IMR removing ENSO effect	0.34	90% loc
	4	ENSO and IMR removing GRESIA effect	-0.29	insignificant
II	1	GRESIA and KMR	-0.40	95% loc
	2	ENSO and KMR	0.18	insignificant
	3	GRESIA and KMR removing ENSO effect	-0.36	95% loc
	4	ENSO and KMR removing GRESIA effect	0.03	insignificant

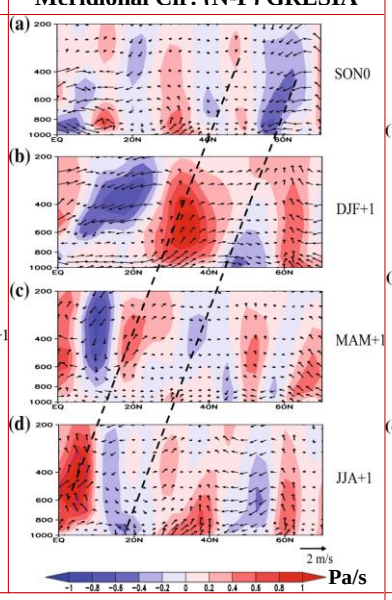
Pacific SSTs during (N-P) GRESIA Extremes



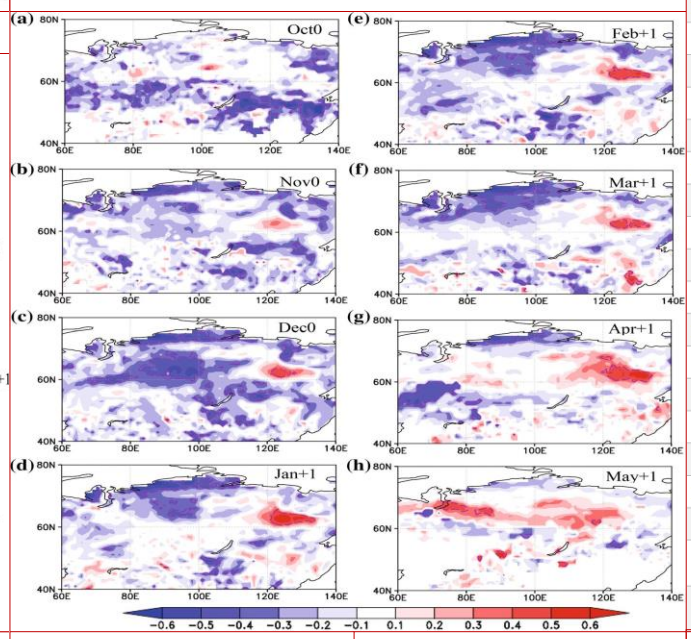
Zonal Cir: (N-P) GRESIA



Meridional Cir: (N-P) GRESIA

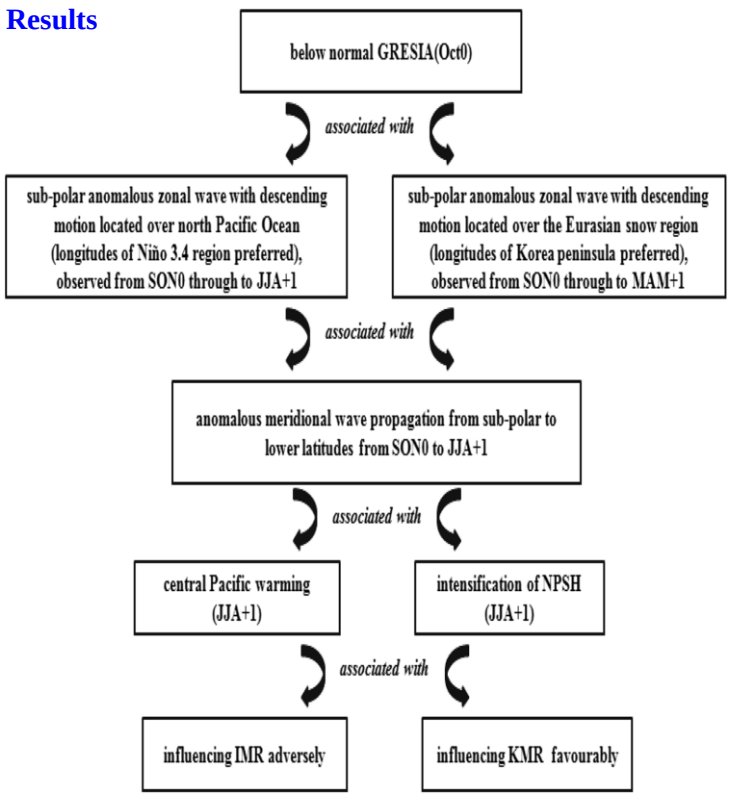


Physical mechanism 2: possible route for GRESIA through Eurasian Snow CC: GRESIA (Oct0) v/s Snow: 1983-2007

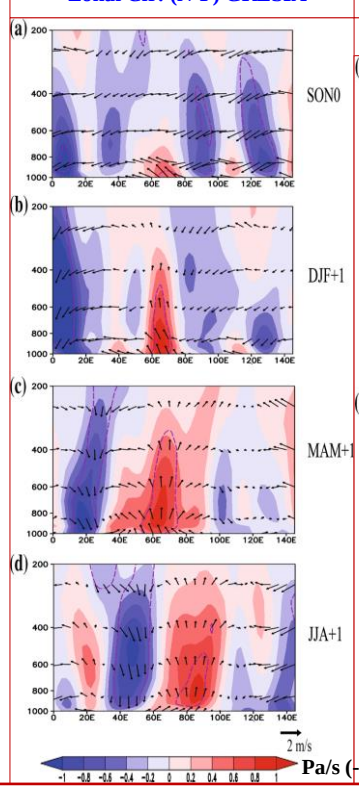


Set No.	Sr. No.	Correlation for the period 1983-2007	Correlation coefficient	Significance
I	1	GRESIA and IMR	0.45	95% loc
	2	SWEI and IMR	-0.26	insignificant
	3	GRESIA and IMR removing SWEI effect	0.39	95% loc
	4	SWEI and IMR removing GRESIA effect	-0.08	insignificant
II	1	GRESIA and KMR	-0.40	95% loc
	2	SWEI and KMR	0.19	insignificant
	3	GRESIA and KMR removing SWEI effect	-0.35	90% loc
	4	SWEI and KMR removing GRESIA effect	0.02	insignificant
III	1	GRESIA and IMR	0.45	95% loc
	2	SWEK and IMR	0.37	90% loc
	3	GRESIA and IMR removing SWEK effect	0.39	95% loc
	4	SWEK and IMR removing GRESIA effect	0.29	insignificant
IV	1	GRESIA and KMR	-0.40	95% loc
	2	SWEK and KMR	-0.39	95% loc
	3	GRESIA and KMR removing SWEK effect	-0.33	90% loc
	4	SWEK and KMR removing GRESIA effect	-0.32	90% loc

Results

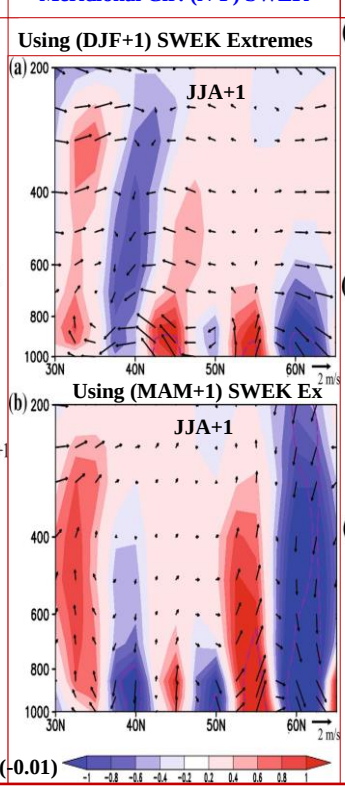


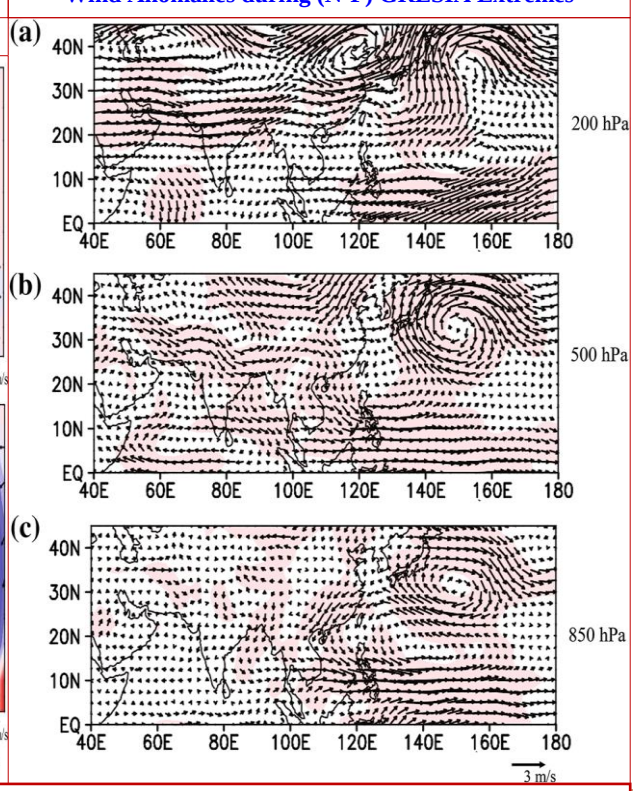
Zonal Cir: (N-P) GRESIA



Meridional Cir: (N-P) SWEK

Using (DJF+1) SWEK Extremes



Using (MAM+1) SWEK Ex

Wind Anomalies during (N-P) GRESIA Extremes