Impact of spectral nudging in the simulation of summer monsoon rainfall over India
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T. S. Saikrishna[1], Dandi .A. Ramu[2] , K. B. R. R. Hari Prasad[3], K.K. Osuri[1], and A. S. Rao[2]
[1]Department of Earth and Atmospheric Sciences, National Institute of Technology Rourkela,India,
[2]Indian Institute of Tropical Meteorology, Pune, Maharastra, India,
[3]National Centre for Medium Range Weather Forecasting, Noida, Uttar Pradesh, India

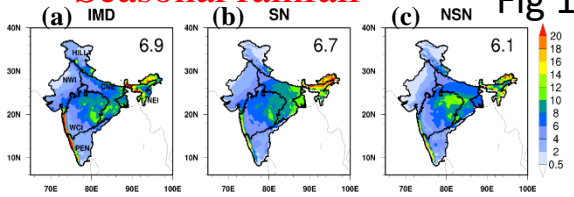**Presented by: TIRUMANI SIVA SAI KRISHNA**
sivasai351@gmail.com

Objective of the paper : The study evaluated the impct of spectral nudging in the simulation of ISMR variablity at (i) seasonal and (ii) sub-seasonal time scales over India and its homogeneous monsoon regions. It also assess the fedility of the model in capturing the monsoon extremes.
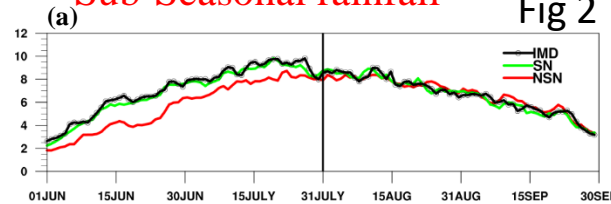
Data, Methodology, Results & Summary

Data: ECMRWF at 75km is used as IC/BC for model, and simulated rainfall is validated with IMD at ~25km.
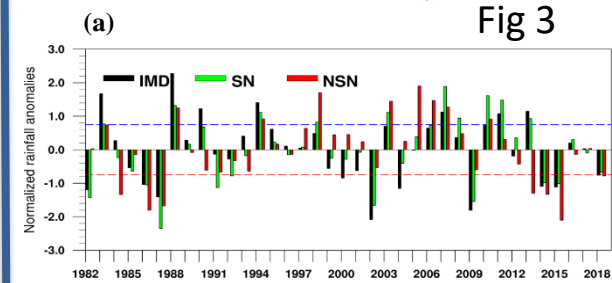
Results:

Seasonal rainfall — Fig 1

|	BIAS (mm day^{-1})						
Exp	PEN	NEI	HILLY	WCI	NWI	CNE	All India
SN	-0.29	1.18	-0.54	-0.25	-0.20	0.76	0.67
NSN	0.45	-1.47	-0.53	-0.23	-1.59	-0.47	-0.65
	RMSE (mm day^{-1})						
SN	4.1	7.3	3.6	3.8	3.1	4.7	4.5
NSN	5.6	8.3	4.7	6.4	5.0	6.1	6
	CC						
SN	0.39	0.48	0.64	0.77	0.79	0.65	0.62
NSN	0.16	0.33	0.38	0.40	0.42	0.41	0.35

Sub-Seasonal rainfall — Fig 2

Sim. Time	EXP	RMSE (mm day^{-1})						
		PEN	NEI	HILLY	WCI	NWI	CNE	All India
June	SN	4	8.5	3	3	2	4	1.5
	NSN	7	10	4	6	4	6	3.5
July	SN	4.5	7.5	3.5	4	4	5.5	2
	NSN	5	8.5	5	8	6.5	7	3.5
Aug	SN	4	7	4	4	3.5	5	2
	NSN	5	7	5	6.5	5	6	2.6
Sep	SN	4	6	4	3	2.5	4	1.5
	NSN	5	7	5	5	4	5.5	2.5

Inter-Annual Variability of ISMR — Fig 3

(a)

(b) Normal   (c) Excess   (d) Deficit
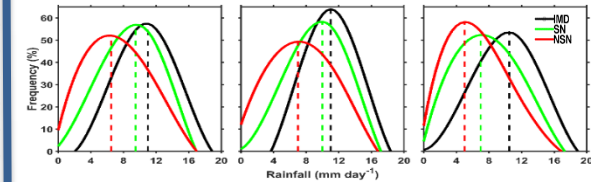
Summary

❖ In both Seasonal and Sub-seasonal scales, spectral nudging proved better rainfall distribution and magnitudes.

❖ ,Improved spatial rainfall patterns and magnitudes are found with spectral nudging in seasonal and sub-seasonal scales.

❖ Reduced rainfall biases are observed over India as a whole and it's 5 homogeneous monsoon regions out of 6 in SN .

❖ Significant improvement in daily rainfall is observed in first 60 day's spectral nudging experiment compared to no spectral nudging.