

Better Understanding of Interregional Teleconnections for Prediction in the Monsoon and Poles (BITMAP)

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BITMAP is an Indo-UK-German project to develop better understanding of processes linking the Arctic and Asian monsoon, leading to better prospects for prediction on short, seasonal and decadal scales in both regions. This presentation gives an overview of the BITMAP project.

Recent work has suggested that the pole-to-equator temperature difference is an essential ingredient driving variations in the monsoon. A key focus of BITMAP is thus the impact of the temperature difference between pole and equator on the establishment and variation of regional circulations. We will use existing databases of multiple climate models to unpack the impact of different forcing agents (e.g. greenhouse gases and polluting aerosols) on the relative warming of the northern and southern hemispheres and pole-to-equator temperature gradients. Next we will relate the gradient to position of the strongest rainfall and strength and position of monsoon circulation. We will also examine the impact of different pole-to-equator temperatures on hydroclimates of the vulnerable Hindu Kush-Himalaya (HKH) region in High Asia. At the pole, we will test the impact (if any) of diabatic heating arising from the monsoon rainfall on Arctic circulation patterns by conducting novel experiments with climate models.

Initial findings from BITMAP have used observations and reanalysis data to characterise Western Disturbances, a type of winter storm embedded in the subtropical westerly jet stream, which bring heavy rains to parts of South Asia in wintertime (Hunt *et al.*, 2018a,b). BITMAP will follow up this work by examining the impact of changing climate on the pole-to-equator temperature gradient on which the jetstream sits, to determine how these storms have changed, and will change in the future.

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Key words: JPI Climate-Belmont Forum, teleconnections, monsoon, Arctic, Western Disturbances

References

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