

”Hot spot” in the climate system: A nation-wide project on multi-scale air-sea interaction in midlatitudes

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In this overview talk, the PI introduces a nation-wide project on multi-scale air-sea interactions under the East-Asian monsoon, seeking for future collaborations with scientists in related fields. The PI and other core members of the project have recently found several key phenomena that strongly suggest active roles of the midlatitude ocean, especially, strong western boundary currents (WBCs), in shaping the mean state of the climate and influencing its variability. In particular, we have been focusing on a huge amount of heat and moisture released from the narrow, warm WBCs into the atmosphere, postulating the concept of ”hot spot” in the climate as concentrated thermo-dynamical forcing on the atmosphere. In this project, we attempt to further develop the particular framework we have postulated by focusing on the Far East/ northwestern (NW) Pacific sector, as the most profound ”hot spot” in our climate system, where the sharp thermal contrasts form in both meridional and zonal directions under the influence of the East-Asian monsoon and the confluence of the Kuroshio and Oyashio currents. Unifying advanced high-resolution numerical modeling on the Earth Simulator (ES) and new-generation satellite data and conducting in-situ observation campaigns, we aim to deepen our understanding of multi-scale interactive processes involved actively in the air-sea heat and freshwater exchanges and their influence on the climate variability.

Keywords: air-sea interaction, western boundary currents, Kuroshio, monsoon, climate system, nation-wide project