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Intensification of TY Chan-Hom interacted with other two typhoons and mid-latitude cloud trough in the East and South China Seas

The development of TY 1509, Chan-Hom under the associated with two different sizes of typhoons such as a smaller severe tropical storm and a stronger typhoon TY 1511 Nangka and a mid-latitude cloud trough was investigated using Korean satellite COM IRI images, weather maps and numerically calculated moisture fluxes and streamlines at 850 hPa level (approximately 1.5 km height above the sea surface) by a 3D-numerical model, called the UM-KMA meteorological model from July 4 through 10, 2015. Severe tropical storm Linfa and typhoon Chan-Hom maintaining their independent moving tracks did not have any interaction between them until July 5, 2015. However, TY Chan-Hom moving westward was strongly pulled north-westward by a mid-latitude cloud trough extending from the East China Sea to Hokkaido, Japan and further weakly drawn by SRS Linfa. From July 6 to 8, persistent north-westward STS Linfa was strongly pulled northward by more intensified TY Chan-Hom which was moving north-westward by strong south-westerly wind generated by the mid-latitude cloud trough in the north of Chan-Hom. The interaction of TY Chan-Hom with STS Lifa induced a shorter distance between two typhoon centers and TY Chan-Hom should be closed to Taipei. Even though Linfa was closed to Gangzhou in the southern China and its cyclonic circulation was weaken by big friction caused by surrounding land and shallower bottom topography of the South China Sea, it was still developed until July 8, due to the transportation of momentum from the stronger typhoon Chan-Hom and kinetic energy converted from the release of latent heat flux during the condensation process of supplied water vapor. From July 9 to 10, as TY Chan-Hom additionally interacted with TY Nangka in its east (the West Pacific Ocean) and continuously induced by the mid-latitude cloud trough, it should be more intensified. It means that windstorm over 25 kt was detected in the upper quadrant and right hand side of their cyclonic circulations, showing asymmetric distribution of wind fields. Under this circumstance, Chan-Hom could change its track from north-westward into northward, finally passing by the Yellow Sea without its landfall near Shanghai. Although the landfall of Linfa was delayed by the interaction of TY Chan-Hom, changing its moving track toward north-north-west, STS Linfa became weakened closing to the inland of Gangdong province, showing no longer tightly packed bands of cloud and being extinct.

Biography

Hyo Choi is a Meteorologist, Environmental Scientist and Physical Oceanographer with over 40 years experiences in numerical modeling researches as Overseas Senior Researcher invited by Korean Government of Korea Ocean Research & Development Institute (KORDI of KAIST, (now, KIOST)), Ministry of Science & Technology, a high-level Researcher of National Fisheries & Research Development Institute (NFRDI) (nominated by President of Korean Government), Ministry of Maritime Affairs & Fisheries and Full Professor of Gangneung-Wonju National University. He has obtained 2 PhD degrees from Department of Civil Engineering, University of Texas at Austin, USA (1984) and College of Environmental Sciences, Peking University, Beijing; China (2004). His research interests cover a variety of fields in Meteorology, Environmental Science & Engineering and Physical Oceanography.. Presently, he is Director General of Atmospheric & Oceanic Disaster Research Institute, Korea, High-end Foreign Expert of South China Sea Institute of Oceanology, China and also acting as Editor-in-Chief of 13 international journals and Editor of 26 ones in atmospheric environmental pollution, disaster, agriculture, food sciences, water resources, lake and rivers, GIS, physical sciences, oceanography, fishery and meteorology.

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