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## Development of stadium-specific numerical forecast guidance for weather forecast for the 2024 Gangwon Winter Youth Olympic Games

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The 2024 Gangwon Winter Youth Olympic Games (GANGWON 2024) will be held in the province of Gangwon in the Republic of Korea from January 19 to February 1, 2024, which already hosted the Olympic Winter Games PyeongChang 2018. In order to successfully host these first Winter YOG to be held in Asia, which will be held for the first time in Asia, it is necessary to provide customized weather information for decision-making in game operation and support in establishing game strategies for athletes and their teams. Accordingly, the Korea Meteorological Administration develops point-specific numerical forecast guidance for major stadiums and provides it to the field to support successful hosting of YOG and improvement of performance. Numerical forecast guidance is the final data delivered to consumers or forecasters as post-processed numerical model data that has been corrected by applying altitude correction and statistical methods to produce highly accurate forecasts. For a total of 13 forecast elements (temperature, minimum/maximum temperature, humidity, wind direction/speed, precipitation, new snow cover, sky conditions, precipitation probability, precipitation type), we developed user-customized numerical forecast guidance specialized for competition points (Gangneung Olympic Park, Pyeongchang Alpensia Venue, Biathlon Center, Olympic Sliding Center departure/arrival, Wellyhilli departure/arrival, High1 departure/arrival). Through the process of Perfect Prognostic Method (PPM), Model Output Statistics (MOS), optimization, and optimal merging, the systematic errors inherent in the numerical model are removed, and the optimal data (BEST) with improved forecasting performance is provided as customized numerical forecast guidance specific to stadium locations. In the prediction performance evaluation for the period of December 2023, the accuracy (improvement rate) compared to the average of available models was temperature 1.49% (18%), humidity 12% (25%), wind speed 1.87m/s (33%), and visibility 12.8km (17%).