Development of Extraction Algorithm of Strong Wind Area Caused by Gusts using Meteorological Radar Information

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Since gusts such as tornados, gust fronts, and downbursts are localized and short-time phenomena, these gusts cannot be always detected by existing anemometers along railways used for train operation. Therefore, to secure the safety of train operation against these gusts, we developed an algorithm for extracting ground strong wind area caused by them. This algorithm is based on two elements. One is to detect the gust index of upper air from the echo and Doppler wind velocity observed by existing radar, and the other is to estimate the surface wind velocity from the gust index of upper air by using results obtained from the reproduction calculation of previous gust events based on meteorological models.