Storm observation system with 4-D weather database

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A system of country-wide multi-sensor storm observations, nowcasting and early warning "MARS-Center" (Meteorological Automated Radar observation System for weather Centers) was developed by Institute of Radar Meteorology (IRAM). Since the beginning of 2019, the system is operated by the national weather service of Belarus – Belarus' National Center for Hydrometeorology, Radioactive Pollution Control and Environmental Monitoring (Belhydromet). Specialized meteorological time-geospatial database "MeteoCube" is used as a unified hydrometeorological platform for processing data from diverse observation networks, storing it with high temporal and spatial resolution and presenting it to end-users through web-based graphical and programming interfaces. This platform facilitates development, operational prototyping, adjustment and deployment of new weather products for various applications.

National weather radar network consisting of radars of different manufacturers, BALTRAD network, automatic surface weather observation stations with 10-minute update cycle, and global and reginal numerical weather models are used as primary data sources for the system. Also, lightning detection networks and aviation reports and warnings are used when available. Composite multi-sensor weather phenomena maps including thunderstorm and hail detection products with warnings, and nowcasting for points of interest are generated and provided to all Belhydromet's departments and regional hydrometeorological offices including airports and aviation Met watch offices in real-time. Moreover, these products might be provided to adjacent NWS's for collaborative decision-making using dedicated web-site. Some of the products are also issued to public via official web-portal of Belhydromet.