Application of Association Rule in Disaster Weather Forecasting

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Abstract
Recently, the evidences have indicated that the heavy rainfall in Yangtze River Basin is directly caused by Mesoscale Convective System (MCS) over the Tibetan Plateau in China. In this paper, the trajectories of MCS over the Tibetan Plateau are automatically tracked using GMS (Geostationary Meteorological Satellite) brightness temperature (Tbb) and High Resolution Limited Area Analysis and Forecasting System (HLAFS) data provided by China National Satellite Meteorological Center from June to August 1998. Based on these, the relationships between the trajectories of MCSs moving out of the Plateau and their environmental physical field values are analyzed using spatial association rule mining technique. The results indicate that at the level of 400hPa, the trajectories of MCSs, which move out of the Plateau, are mainly influenced by geopotential height, relative humidity, vorticity, divergence and vertical wind speed, while at the level of 500hPa, geopotential height, relative humidity, temperature, vertical wind speed and K index are the main factors which influence MCS to move out of the Plateau.