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Parallax Correction of Cumulonimbus Clouds in Extreme Weather Events

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The main problem in the use of satellite imagery is the parallax bias for the location of areas that are far from the satellite orbit. This is a major concern for BMKG in the use of satellite imagery for routine operations in providing weather information services to the public. Himawari satellite became the main tool that is very helpful for forecasters in making analysis, forecasts and early warning of the weather. Therefore, parallax correction is needed to determine the actual position of the clouds in the Himawari satellite image. In this study focused on parallax correction of Cumulonimbus (CB) clouds that often cause extreme weather, especially heavy rain that has an impact on flooding. The data samples were taken from January to August 2023 and selected according to the occurrence of heavy rain at the appropriate time. The Data used are extreme weather event data, Himawari High-Resolution Cloud Analysis Information (HCAI) satellite imagery and ECMWF - IFS Numerical Model. Cumulonimbus cloud parallax correction is done by using 2 methods, namely: 1) correction by using surface temperature IFS model every hour. Then calculate the lapse rate using the surface temperature and the cloud top temperature to get the height of the cloud top. The Cloud Peak Height is used for the CB parallax correction of HCAI. 2) parallax correction by using CB Cloud Peak Height data directly from HCAI. The result of parallax correction calculations using these two methods basically is not much different, with advantages in the correction method using the surface temperature IFS model. Correction of CB

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location about 6-10 km to the northeast of CB position before parallax correction.

Keywords: Parallax correction, Cumulonimbus, Himawari, HCAI, Lapse Rate, IFS, Cloud
Peak Height