



## **Tropospheric Gradients from Numerical Weather Models and the Indonesian CORS Network**

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Several institutions and universities in Indonesia have built permanent GNSS stations, known as Continuously Operating Reference Stations (CORS), since the early 1990s. The official Indonesian CORS network is known as InaCORS, which is managed and operated by the Indonesian Geospatial Information Agency (BIG). The network supports a wide range of scientific and practical applications, which often require very high accuracy. In order to obtain the desirable accuracy, various error sources need to be dealt with, including zenith tropospheric delays and horizontal gradients. Horizontal gradients are used to account for azimuthal asymmetry of the delays, and can be calculated from numerical weather models or GNSS observations. This research compares the gradients computed from the European Centre for Medium-Range Weather Forecasts (ECMWF) re-analysis data and from InaCORS observations, to assess whether gradients from numerical weather models fit well with real observations. North and east gradients were computed twice a day (00 and 12 UTC) from ECMWF data (GRAD) and GNSS observations for 135 InaCORS sites. The values of correlation coefficients are typically around 0.2 and 0.3, with north gradients tending to have larger values. The largest correlation coefficient values for both north and east gradients are 0.48 and 0.30 at site CUKE.