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Simulation of the diurnal cycle of Ciliwung River, Jawa, Indonesia

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This study focuses on a simulation of the diurnal cycle of Ciliwung river water level observed during the intensive observational period of HARIMAU2010 (15 January to 15 February 2010) over JABODETABEK (greater Jakarta) region, by using a distributed hydrological model (the CDRMV3 model).

Rainfall data over this region have been obtained from a C-band Doppler radar (CDR), by using Marshall-Palmer formula. We have found that there are diurnal cycles of rainfall migrating in the meridonal direction from south (mountain) to north (coastline) mainly in the afternoon and in the opposite direction mainly in the morning. Therefore, we consider that such rainfall characteristics may cause the diurnal cycle of water level over Ciliwung river basin.

Using the CDR rainfall data, the CDRMV3 model has been used to simulate runoff for each sub catchment in the Ciliwung river basin. Discharges from simulation results have been verified with the discharge from observational data. Simulations for the cases of meridional migration of rainfall with diurnal cycle provide large discharges as observed actually.

Keywords: Weather radar, Diurnal Cycle, Distributed hydrological model, Rainfall, Runoff