

## INTISARI

Teknologi pemetaan fotogrametri telah berkembang dengan pesat, termasuk dalam bidang *direct georeferencing*. Teknologi pemotretan udara dengan metode *direct georeferencing* melalui penentuan posisi dan orientasi kamera (sensor) yang diukur menggunakan *onboard receiver GNSS* dan *inertial measurement unit (IMU)* telah banyak dilakukan, baik *direct georeferencing* maupun *direct georeferencing* dengan titik kontrol tanah (TKT), yang dalam penelitian ini disebut *indirect georeferencing*. Penelitian ini bertujuan untuk mengkaji ketelitian horizontal mosaik ortofoto hasil *direct georeferencing* dan *indirect georeferencing*.

Akuisisi data dilakukan di kecamatan Rakumpit, Palangkaraya, Kalimantan tengah. Foto udara diperoleh dari hasil pemotretan kamera format medium yang berjumlah 555 foto dengan luas area 4.327 hektar. Pemrosesan foto menjadi mosaik ortofoto dilakukan dengan dua metode yaitu *direct georeferencing* dan *indirect georeferencing* dengan TKT yang diukur menggunakan *Global Navigation Satellite System (GNSS)*. Pemrosesan data dilakukan menggunakan *software* ApplicationMaster (Inpho) dengan tahapan *input* data ( kalibrasi kamera, foto udara, parameter orientasi luar, *boresigt*) dan TKT untuk metode *indirect georeferencing*. Selanjutnya melakukan *bundle block adjustment* melalui tool MatchAT, lalu *Input DTM* dan *create* ortofoto melalui tool OrtoMaster dan dilanjutkan dengan pembentukan mosaik ortofoto melalui tool OrtoVista. Proses analisis ketelitian dilakukan menggunakan titik *Independent Check Point (ICP)* yang diperoleh dari hasil pengukuran *premark* menggunakan *GNSS* sebanyak 2 titik dan dari hasil identifikasi *postmark* menggunakan data *Intensity* Lidar sebanyak 10 titik. Analisis ketelitian horizontal mengacu pada Peraturan BIG Nomor 6 tahun 2018.

Berdasarkan Peraturan BIG nomor 6 tahun 2018, ketelitian horizontal ortofoto hasil *direct georeferencing* dapat memenuhi standar ketelitian peta dasar skala 1 : 2500 kelas 2 dan ketelitian horizontal ortofoto hasil *indirect georeferencing* dapat memenuhi standar ketelitian peta dasar skala 1 : 1000 kelas 1. Berdasarkan uji hipotesis menggunakan tabel F, diperoleh bahwa varian ketelitian mosaik ortofoto hasil *indirect georeferencing* lebih baik secara signifikan dibanding dengan varian ketelitian mosaik ortofoto hasil *direct georeferencing*.

Kata kunci : Ortofoto, *direct georeferencing*, *indirect georeferencing*.

## ABSTRACT

*Photogrammetry mapping technology has developed rapidly, including direct georeferencing technology. Aerial photogrammetry technology with direct georeferencing method from determining position and orientation of sensor that measured using onboard receiver Global Navigation Satellite System (GNSS) and inertial measurement unit (IMU) has been done a lot, those are direct georeferencing and direct georeferencing with Ground Control Point (GCP), in this research called with indirect georeferencing. This research aims to evaluate horizontal accuracy of mosaic orthophoto of direct georeferencing and indirect georeferencing.*

*Data acquisition is conducted in sub district of Rakumpit, Palangkaraya, central Kalimantan. Aerial photos collected from medium format camera with total of photos are 555 in an area of 4.327 hectares. The Process of photos to be mosaic orthophoto performed in two ways those are direct georeferencing and indirect georeferencing with GCP that measured with GNSS. Aerial photos processed use ApplicationMaster software with stages input data (camera calibration, aerial photos, exterior orientation parameter, boresight) and GCP for indirect georeferencing method. The next stage was bundle block adjustment used Match AT tool, then input the DTM and created the orthophotos used OrtoMaster tool, and continued with mosaicking the orthophotos used Ortovista. Accuracy analyze is processed by use Independent Check Point (ICP) from premark measurement by use GNSS as much 2 point and from postmark identification by use Lidar Intensity as much 10 point. Horizontal accuracy analyze is according to BIG Regulation No 6 years 2018.*

*Based on BIG Regulation No 6 years 2018, horizontal accuracy of mosaic orthophoto of direct georeferencing method is need to fulfill horizontal accuracy standard of 2nd grade 1:2500 base map scale and horizontal accuracy of mosaic orthophoto of indirect georeferencing method is need to fulfill horizontal accuracy standard of 1st grade 1:1000 base map scale. Based on F table test obtained that horizontal accuracy of mosaic orthophoto of indirect georeferencing is better significantly than horizontal accuracy of mosaic orthophoto of direct georeferencing.*

*Keyword : Orthophoto, direct georeferencing, indirect georeferencing.*