

INTISARI

Pengukuran jarak dan sudut menggunakan *Robotic Total Station* memanfaatkan gelombang elektromagnetik. Penggunaan *Robotic Total Station* tidak lepas dari kesalahan yang disebabkan oleh faktor luar seperti keadaan atmosfer. Keadaan atmosfer seperti temperatur, tekanan udara dan kelembaban udara dapat mempengaruhi gelombang elektromagnetik. Perubahan keadaan atmosfer yang tidak tentu dapat mengurangi kecepatan merambat gelombang elektromagnetik, sehingga menimbulkan adanya kesalahan pada hasil pengukuran menggunakan *Robotic Total Station*. Oleh karena itu, perlu dilakukan penelitian tentang pengaruh keadaan atmosfer seperti temperatur dan tekanan udara terhadap hasil pengukuran sudut menggunakan *Robotic Total Station*.

Pada penelitian ini menggunakan data temperatur, tekanan udara, sudut horizontal dan sudut vertikal selama satu bulan. Data temperatur dan tekanan udara merupakan hasil pengukuran menggunakan meteosensor, sedangkan data sudut horizontal dan sudut vertikal merupakan hasil pengukuran menggunakan *Robotic Total Station*. Penelitian ini menggunakan metode regresi linier berganda dan menggunakan *software IBM SPSS Statistics 19*. Tahapan metode regresi linier berganda terdiri atas uji linieritas, uji simultan, uji parsial dan analisis hasil model persamaan regresi. Analisis hasil model persamaan berdasarkan nilai koefisien korelasi, koefisien determinasi dan *Adjusted R²*.

Hasil penelitian ini adalah pada rentang temperatur 21,2°C s.d. 36,4°C dan tekanan 981,6 mmHg s.d. 990,4 mmHg besarnya nilai koreksi sudut horizontal rerata sebesar 0,00000087 radian setiap kenaikan temperatur 1°C dan sebesar 0,00000323 radian setiap kenaikan tekanan udara 1 mmHg. Sedangkan besarnya nilai koreksi sudut vertikal rata-rata sebesar -0,00000033 radian setiap kenaikan temperatur 1°C dan sebesar -0,00000032 radian kenaikan tekanan udara 1 mmHg.

Kata kunci: atmosfer, sudut horizontal, sudut vertikal, *Robotic Total Station*.

ABSTRACT

The distance and angle are measured by Robotic Total Station use electromagnetic waves. The inaccuracy of this technology is due to external factor; the atmosphere. The atmosphere condition that includes the air temperature, air pressure and relative humidity will affect the electromagnetic wave that is used in measuring by Robotic Total Station. The difference of atmosphere condition can reduce the speed of electromagnetic waves, then causing errors in the results of Robotic Total Station measurements. Due to this matter, it is necessary to study about the influence of air temperature and air pressure to the results of angle measurements by Robotic Total Station.

This research used the data of air temperature, air pressure, vertical and horizontal angle that were collected. The air temperature and air pressure data are the result of meteosensor measurements, while the vertical and horizontal angle are the result of Robotic Total Station measurements. This research used multiple linear regression method and the IBM SPSS Statistics 19 Software was for processing. This multiple linear regression stages consist of linearity test, overall test, and partial test, regression equation test analysis that based on the value of the correlation coefficient, determined coefficient and Adjusted R^2 .

The results of this research are between 21,2°C until 36,4°C and 981,6 mmHg until 990,4 mmHg the horizontal angle correction are 0,00000087 rad in every 1°C temperature increase and 0,00000323 rad in every 1 mmHg air pressure increase. The vertical angle correction are -0,00000033 rad in every 1°C temperature increase and -0,00000032 rad in every 1 mmHg air pressure increase.

Keywords: atmosphere, horizontal angle, vertical angle, Robotic Total Station.