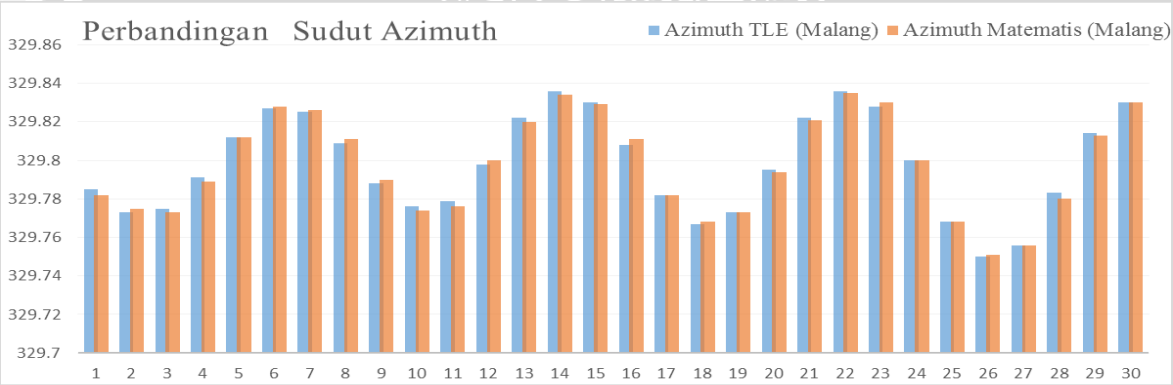
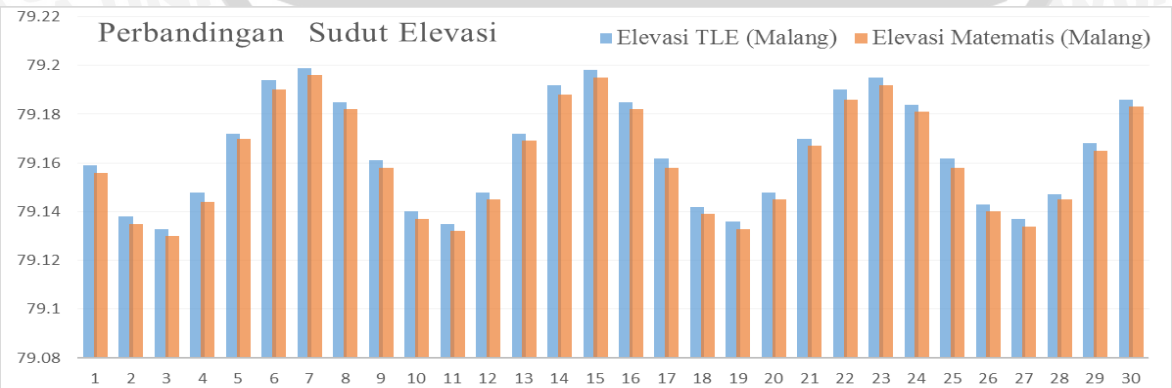
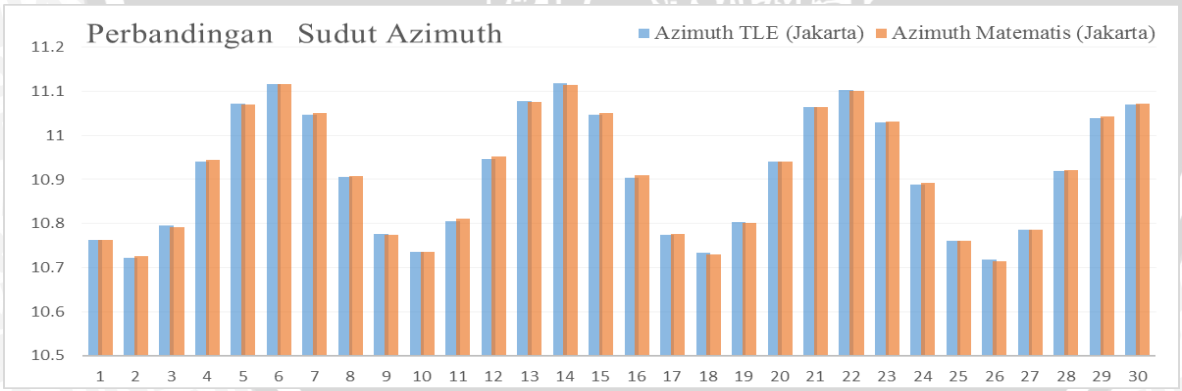
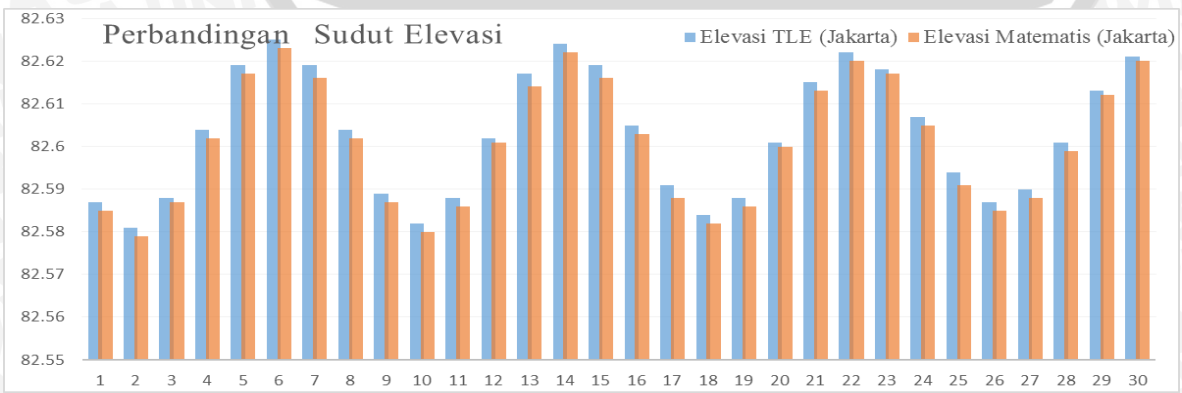
| | SATELIT TELKOM-1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lokasi Dish Antenna | | | Lokasi satelit | | Perhitngan | | | |
| | Latitude | Longitude | Altitude | Latitude | Longitude | Two Line Elements | | Matematis | |
| | | | | | | Azimuth | Elevasi | Azimuth | Elevasi |
| MALANG | -7.98261554 | 112.6308375 | 453 | 0.004 | 108.009 | 329.785 | 79.159 | 329.782 | 79.156 |
| | -7.98261554 | 112.6308375 | 453 | 0.019 | 107.999 | 329.773 | 79.138 | 329.775 | 79.135 |
| | -7.98261554 | 112.6308375 | 453 | 0.022 | 107.997 | 329.775 | 79.133 | 329.773 | 79.13 |
| | -7.98261554 | 112.6308375 | 453 | 0.013 | 108.005 | 329.791 | 79.148 | 329.789 | 79.144 |
| | -7.98261554 | 112.6308375 | 453 | -0.004 | 108.019 | 329.812 | 79.172 | 329.812 | 79.17 |
| | -7.98261554 | 112.6308375 | 453 | -0.018 | 108.03 | 329.827 | 79.194 | 329.828 | 79.19 |
| | -7.98261554 | 112.6308375 | 453 | -0.022 | 108.032 | 329.825 | 79.199 | 329.826 | 79.196 |
| | -7.98261554 | 112.6308375 | 453 | -0.013 | 108.024 | 329.809 | 79.185 | 329.811 | 79.182 |
| | -7.98261554 | 112.6308375 | 453 | 0.003 | 108.011 | 329.788 | 79.161 | 329.79 | 79.158 |
| | -7.98261554 | 112.6308375 | 453 | 0.017 | 108 | 329.776 | 79.14 | 329.774 | 79.137 |
| | -7.98261554 | 112.6308375 | 453 | 0.021 | 107.998 | 329.779 | 79.135 | 329.776 | 79.132 |
| | -7.98261554 | 112.6308375 | 453 | 0.013 | 108.007 | 329.798 | 79.148 | 329.8 | 79.145 |
| | -7.98261554 | 112.6308375 | 453 | -0.003 | 108.02 | 329.822 | 79.172 | 329.82 | 79.169 |
| | -7.98261554 | 112.6308375 | 453 | -0.016 | 108.03 | 329.836 | 79.192 | 329.834 | 79.188 |
| | -7.98261554 | 112.6308375 | 453 | -0.021 | 108.032 | 329.83 | 79.198 | 329.829 | 79.195 |
| | -7.98261554 | 112.6308375 | 453 | -0.013 | 108.024 | 329.808 | 79.185 | 329.811 | 79.182 |
| | -7.98261554 | 112.6308375 | 453 | 0.002 | 108.01 | 329.782 | 79.162 | 329.782 | 79.158 |
| | -7.98261554 | 112.6308375 | 453 | 0.015 | 108 | 329.767 | 79.142 | 329.768 | 79.139 |
| | -7.98261554 | 112.6308375 | 453 | 0.02 | 107.998 | 329.773 | 79.136 | 329.773 | 79.133 |
| | -7.98261554 | 112.6308375 | 453 | 0.013 | 108.006 | 329.795 | 79.148 | 329.794 | 79.145 |
| | -7.98261554 | 112.6308375 | 453 | -0.001 | 108.019 | 329.822 | 79.17 | 329.821 | 79.167 |
| | -7.98261554 | 112.6308375 | 453 | -0.014 | 108.029 | 329.836 | 79.19 | 329.835 | 79.186 |
| | -7.98261554 | 112.6308375 | 453 | -0.019 | 108.031 | 329.828 | 79.195 | 329.83 | 79.192 |
| | -7.98261554 | 112.6308375 | 453 | -0.013 | 108.022 | 329.8 | 79.184 | 329.8 | 79.181 |
| | -7.98261554 | 112.6308375 | 453 | 0.001 | 108.008 | 329.768 | 79.162 | 329.768 | 79.158 |
| | -7.98261554 | 112.6308375 | 453 | 0.013 | 107.998 | 329.75 | 79.143 | 329.751 | 79.14 |
| | -7.98261554 | 112.6308375 | 453 | 0.018 | 107.996 | 329.756 | 79.137 | 329.756 | 79.134 |
| | -7.98261554 | 112.6308375 | 453 | 0.012 | 108.004 | 329.783 | 79.147 | 329.78 | 79.145 |
| | -7.98261554 | 112.6308375 | 453 | 0 | 108.017 | 329.814 | 79.168 | 329.813 | 79.165 |
| | -7.98261554 | 112.6308375 | 453 | -0.012 | 108.027 | 329.83 | 79.186 | 329.83 | 79.183 |



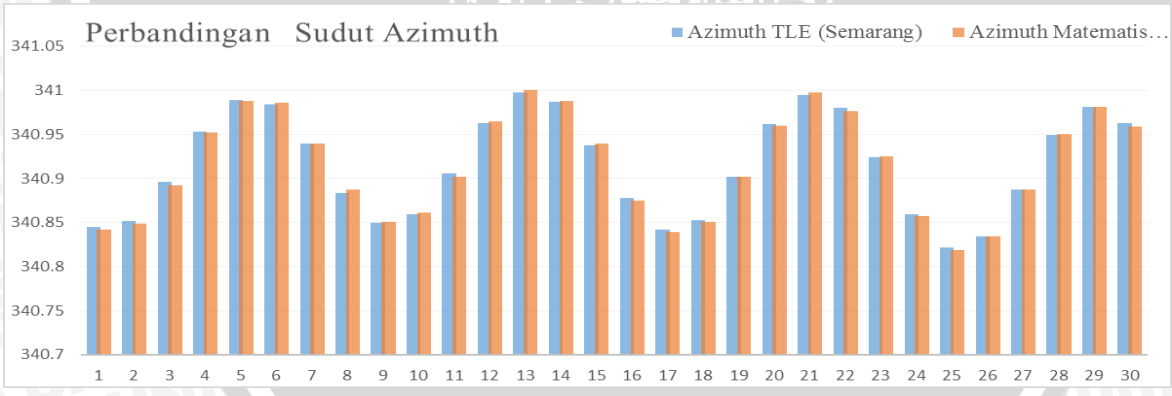



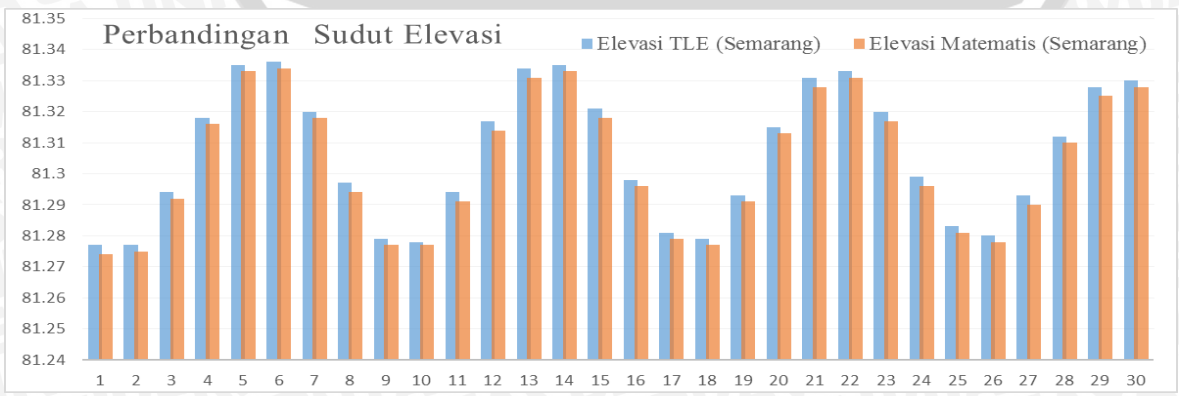
| | SATELIT TELKOM-1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lokasi Dish Antenna | | | Lokasi satelit | | Perhitngan | | | |
| | Latitude | Longitude | Altitude | Latitude | Longitude | Two Line Elements | | Matematis | |
| | | | | | | Azimuth | Elevasi | Azimuth | Elevasi |
| JAKARTA | -6.175649 | 106.826635 | 4 | 0.017 | 108 | 10.762 | 82.587 | 10.762 | 82.585 |
| | -6.175649 | 106.826635 | 4 | 0.023 | 107.997 | 10.722 | 82.581 | 10.725 | 82.579 |
| | -6.175649 | 106.826635 | 4 | 0.015 | 108.003 | 10.795 | 82.588 | 10.792 | 82.587 |
| | -6.175649 | 106.826635 | 4 | -0.001 | 108.017 | 10.94 | 82.604 | 10.945 | 82.602 |
| | -6.175649 | 106.826635 | 4 | -0.016 | 108.028 | 11.073 | 82.619 | 11.07 | 82.617 |
| | -6.175649 | 106.826635 | 4 | -0.022 | 108.032 | 11.117 | 82.625 | 11.116 | 82.623 |
| | -6.175649 | 106.826635 | 4 | -0.015 | 108.026 | 11.047 | 82.619 | 11.05 | 82.616 |
| | -6.175649 | 106.826635 | 4 | 0 | 108.013 | 10.906 | 82.604 | 10.907 | 82.602 |
| | -6.175649 | 106.826635 | 4 | 0.015 | 108.001 | 10.776 | 82.589 | 10.774 | 82.587 |
| | -6.175649 | 106.826635 | 4 | 0.022 | 107.998 | 10.735 | 82.582 | 10.735 | 82.58 |
| | -6.175649 | 106.826635 | 4 | 0.015 | 108.005 | 10.806 | 82.588 | 10.81 | 82.586 |
| | -6.175649 | 106.826635 | 4 | 0 | 108.018 | 10.947 | 82.602 | 10.952 | 82.601 |
| | -6.175649 | 106.826635 | 4 | -0.014 | 108.029 | 11.077 | 82.617 | 11.075 | 82.614 |
| | -6.175649 | 106.826635 | 4 | -0.021 | 108.032 | 11.118 | 82.624 | 11.114 | 82.622 |
| | -6.175649 | 106.826635 | 4 | -0.015 | 108.026 | 11.046 | 82.619 | 11.05 | 82.616 |
| | -6.175649 | 106.826635 | 4 | -0.001 | 108.013 | 10.904 | 82.605 | 10.909 | 82.603 |
| | -6.175649 | 106.826635 | 4 | 0.014 | 108.001 | 10.775 | 82.591 | 10.776 | 82.588 |
| | -6.175649 | 106.826635 | 4 | 0.02 | 107.997 | 10.734 | 82.584 | 10.73 | 82.582 |
| | -6.175649 | 106.826635 | 4 | 0.015 | 108.004 | 10.803 | 82.588 | 10.801 | 82.586 |
| | -6.175649 | 106.826635 | 4 | 0.001 | 108.017 | 10.94 | 82.601 | 10.941 | 82.6 |
| | -6.175649 | 106.826635 | 4 | -0.013 | 108.028 | 11.065 | 82.615 | 11.064 | 82.613 |
| | -6.175649 | 106.826635 | 4 | -0.019 | 108.031 | 11.103 | 82.622 | 11.102 | 82.62 |
| | -6.175649 | 106.826635 | 4 | -0.015 | 108.024 | 11.03 | 82.618 | 11.032 | 82.617 |
| | -6.175649 | 106.826635 | 4 | -0.002 | 108.011 | 10.889 | 82.607 | 10.893 | 82.605 |
| | -6.175649 | 106.826635 | 4 | 0.012 | 107.999 | 10.761 | 82.594 | 10.761 | 82.591 |
| | -6.175649 | 106.826635 | 4 | 0.018 | 107.995 | 10.719 | 82.587 | 10.715 | 82.585 |
| | -6.175649 | 106.826635 | 4 | 0.014 | 108.002 | 10.786 | 82.59 | 10.785 | 82.588 |
| | -6.175649 | 106.826635 | 4 | 0.002 | 108.015 | 10.92 | 82.601 | 10.922 | 82.599 |
| | -6.175649 | 106.826635 | 4 | -0.011 | 108.026 | 11.04 | 82.613 | 11.043 | 82.612 |
| | -6.175649 | 106.826635 | 4 | -0.017 | 108.02 | 11.07 | 82.621 | 11.072 | 82.62 |



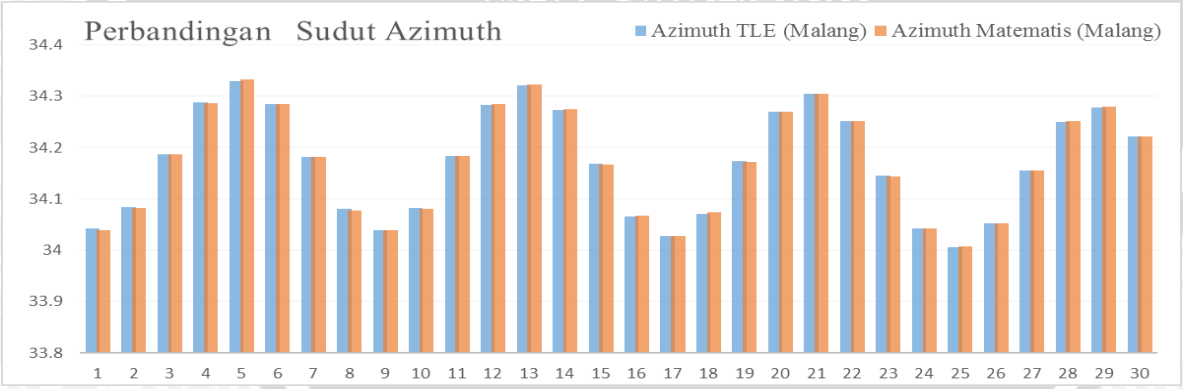



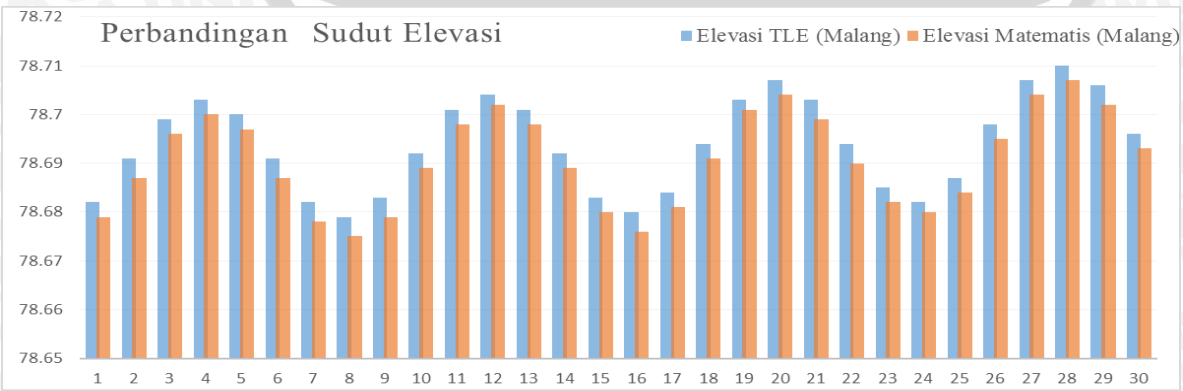
| | SATELIT TELKOM-1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lokasi Dish Antenna | | | Lokasi satelit | | Perhitngan | | | |
| | Latitude | Longitude | Altitude | Latitude | Longitude | Two Line Elements | | Matematis | |
| | | | | | | Azimuth | Elevasi | Azimuth | Elevasi |
| SEMARANG | -6.990385 | 110.422951 | 11 | 0.021 | 107.997 | 340.845 | 81.277 | 340.842 | 81.274 |
| | -6.990385 | 110.422951 | 11 | 0.021 | 107.998 | 340.852 | 81.277 | 340.849 | 81.275 |
| | -6.990385 | 110.422951 | 11 | 0.009 | 108.008 | 340.896 | 81.294 | 340.892 | 81.292 |
| | -6.990385 | 110.422951 | 11 | -0.008 | 108.022 | 340.953 | 81.318 | 340.952 | 81.316 |
| | -6.990385 | 110.422951 | 11 | -0.02 | 108.031 | 340.989 | 81.335 | 340.988 | 81.333 |
| | -6.990385 | 110.422951 | 11 | -0.021 | 108.031 | 340.984 | 81.336 | 340.986 | 81.334 |
| | -6.990385 | 110.422951 | 11 | -0.01 | 108.021 | 340.94 | 81.32 | 340.94 | 81.318 |
| | -6.990385 | 110.422951 | 11 | 0.007 | 108.008 | 340.884 | 81.297 | 340.887 | 81.294 |
| | -6.990385 | 110.422951 | 11 | 0.019 | 107.999 | 340.85 | 81.279 | 340.851 | 81.277 |
| | -6.990385 | 110.422951 | 11 | 0.02 | 108 | 340.859 | 81.278 | 340.861 | 81.277 |
| | -6.990385 | 110.422951 | 11 | 0.01 | 108.009 | 340.906 | 81.294 | 340.902 | 81.291 |
| | -6.990385 | 110.422951 | 11 | -0.006 | 108.023 | 340.963 | 81.317 | 340.965 | 81.314 |
| | -6.990385 | 110.422951 | 11 | -0.018 | 108.032 | 340.998 | 81.334 | 341.001 | 81.331 |
| | -6.990385 | 110.422951 | 11 | -0.02 | 108.031 | 340.987 | 81.335 | 340.988 | 81.333 |
| | -6.990385 | 110.422951 | 11 | -0.01 | 108.021 | 340.938 | 81.321 | 340.94 | 81.318 |
| | -6.990385 | 110.422951 | 11 | 0.005 | 108.007 | 340.878 | 81.298 | 340.875 | 81.296 |
| | -6.990385 | 110.422951 | 11 | 0.017 | 107.998 | 340.842 | 81.281 | 340.839 | 81.279 |
| | -6.990385 | 110.422951 | 11 | 0.019 | 107.999 | 340.853 | 81.279 | 340.851 | 81.277 |
| | -6.990385 | 110.422951 | 11 | 0.01 | 108.009 | 340.902 | 81.293 | 340.902 | 81.291 |
| | -6.990385 | 110.422951 | 11 | -0.005 | 108.022 | 340.962 | 81.315 | 340.96 | 81.313 |
| | -6.990385 | 110.422951 | 11 | -0.016 | 340.998 | 340.995 | 81.331 | 340.998 | 81.328 |
| | -6.990385 | 110.422951 | 11 | -0.019 | 108.029 | 340.98 | 81.333 | 340.976 | 81.331 |
| | -6.990385 | 110.422951 | 11 | -0.01 | 108.019 | 340.924 | 81.32 | 340.925 | 81.317 |
| | -6.990385 | 110.422951 | 11 | 0.004 | 108.005 | 340.859 | 81.299 | 340.857 | 81.296 |
| | -6.990385 | 110.422951 | 11 | 0.015 | 107.996 | 340.822 | 81.283 | 340.819 | 81.281 |
| | -6.990385 | 110.422951 | 11 | 0.018 | 107.997 | 340.834 | 81.28 | 340.834 | 81.278 |
| | -6.990385 | 110.422951 | 11 | 0.01 | 108.007 | 340.887 | 81.293 | 340.887 | 81.29 |
| | -6.990385 | 110.422951 | 11 | -0.003 | 108.02 | 340.949 | 81.312 | 340.95 | 81.31 |
| | -6.990385 | 110.422951 | 11 | -0.014 | 108.028 | 340.981 | 81.328 | 340.981 | 81.325 |
| | -6.990385 | 110.422951 | 11 | -0.017 | 108.026 | 340.963 | 81.33 | 340.959 | 81.328 |



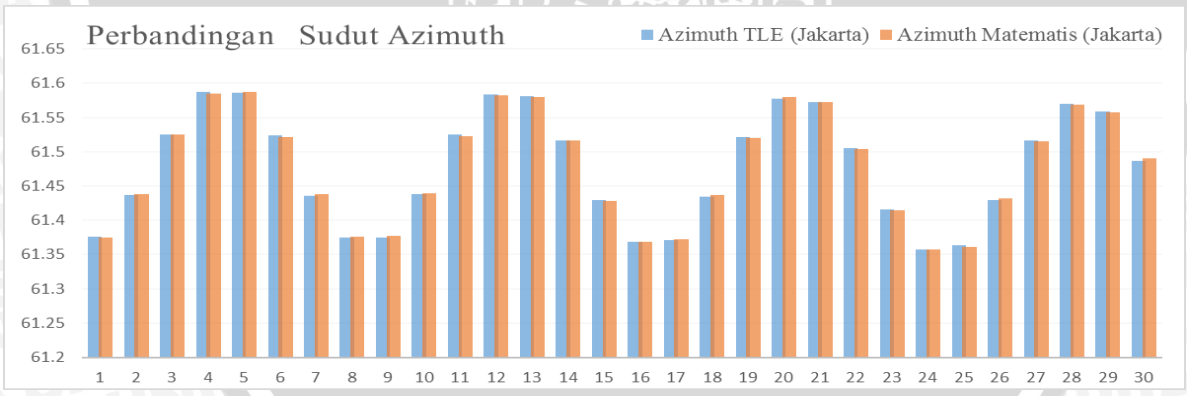



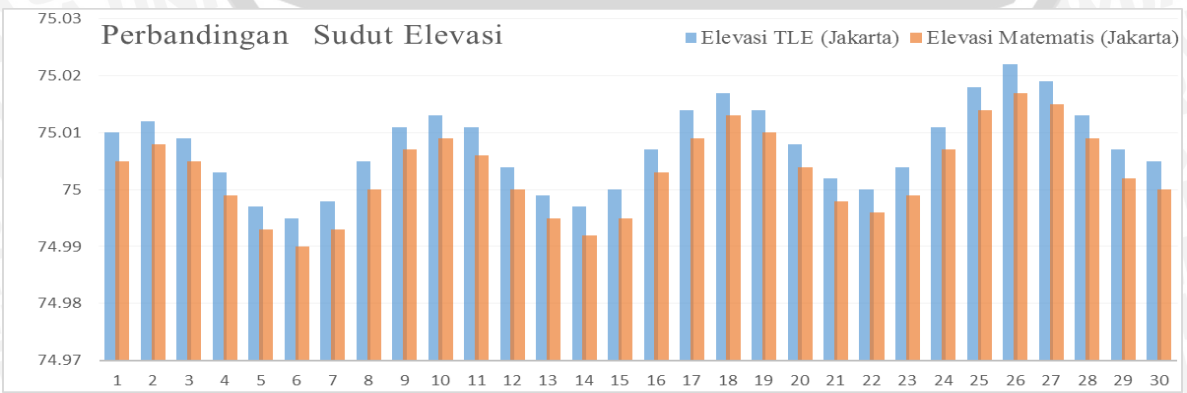
| | SATELIT TELKOM-2 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lokasi Dish Antenna | | | Lokasi satellite | | Perhitngan | | | |
| | Longitude | Latitude | Altitude | Latitude | Longitude | Two Line Elements | | Matematis | |
| | | | | | | Azimuth | Elevasi | Azimuth | Elevasi |
| MALANG | -7.98261554 | 112.6308375 | 453 | 0.02 | 117.998 | 34.042 | 78.682 | 34.039 | 78.679 |
| | -7.98261554 | 112.6308375 | 453 | 0.01 | 118 | 34.084 | 78.691 | 34.083 | 78.687 |
| | -7.98261554 | 112.6308375 | 453 | -0.006 | 118.01 | 34.187 | 78.699 | 34.186 | 78.696 |
| | -7.98261554 | 112.6308375 | 453 | -0.018 | 118.022 | 34.288 | 78.703 | 34.286 | 78.7 |
| | -7.98261554 | 112.6308375 | 453 | -0.02 | 118.03 | 34.329 | 78.7 | 34.332 | 78.697 |
| | -7.98261554 | 112.6308375 | 453 | -0.009 | 118.028 | 34.285 | 78.691 | 34.285 | 78.687 |
| | -7.98261554 | 112.6308375 | 453 | 0.007 | 118.018 | 34.182 | 78.682 | 34.182 | 78.678 |
| | -7.98261554 | 112.6308375 | 453 | 0.019 | 118.005 | 34.08 | 78.679 | 34.078 | 78.675 |
| | -7.98261554 | 112.6308375 | 453 | 0.02 | 117.998 | 34.039 | 78.683 | 34.039 | 78.679 |
| | -7.98261554 | 112.6308375 | 453 | 0.009 | 117.999 | 34.082 | 78.692 | 34.081 | 78.689 |
| | -7.98261554 | 112.6308375 | 453 | -0.007 | 118.009 | 34.184 | 78.701 | 34.184 | 78.698 |
| | -7.98261554 | 112.6308375 | 453 | -0.019 | 118.021 | 34.283 | 78.704 | 34.284 | 78.702 |
| | -7.98261554 | 112.6308375 | 453 | -0.02 | 118.028 | 34.321 | 78.701 | 34.322 | 78.698 |
| | -7.98261554 | 112.6308375 | 453 | -0.009 | 118.026 | 34.273 | 78.692 | 34.275 | 78.689 |
| | -7.98261554 | 112.6308375 | 453 | 0.007 | 118.015 | 34.168 | 78.683 | 34.167 | 78.68 |
| | -7.98261554 | 112.6308375 | 453 | 0.019 | 118.003 | 34.066 | 78.68 | 34.068 | 78.676 |
| | -7.98261554 | 112.6308375 | 453 | 0.019 | 117.995 | 34.027 | 78.684 | 34.028 | 78.681 |
| | -7.98261554 | 112.6308375 | 453 | 0.008 | 117.997 | 34.071 | 78.694 | 34.074 | 78.691 |
| | -7.98261554 | 112.6308375 | 453 | -0.008 | 118.006 | 34.173 | 78.703 | 34.172 | 78.701 |
| | -7.98261554 | 112.6308375 | 453 | -0.019 | 118.018 | 34.27 | 78.707 | 34.269 | 78.704 |
| | -7.98261554 | 112.6308375 | 453 | -0.019 | 118.025 | 34.304 | 78.703 | 34.304 | 78.699 |
| | -7.98261554 | 112.6308375 | 453 | -0.008 | 118.022 | 34.252 | 78.694 | 34.252 | 78.69 |
| | -7.98261554 | 112.6308375 | 453 | 0.008 | 118.011 | 34.145 | 78.685 | 34.144 | 78.682 |
| | -7.98261554 | 112.6308375 | 453 | 0.019 | 117.998 | 34.043 | 78.682 | 34.043 | 78.68 |
| | -7.98261554 | 112.6308375 | 453 | 0.019 | 117.991 | 34.006 | 78.687 | 34.008 | 78.684 |
| | -7.98261554 | 112.6308375 | 453 | 0.007 | 117.992 | 34.053 | 78.698 | 34.053 | 78.695 |
| | -7.98261554 | 112.6308375 | 453 | -0.009 | 118.002 | 34.155 | 78.707 | 34.156 | 78.704 |
| | -7.98261554 | 112.6308375 | 453 | -0.02 | 118.014 | 34.25 | 78.71 | 34.252 | 78.707 |
| | -7.98261554 | 112.6308375 | 453 | -0.019 | 118.02 | 34.278 | 78.706 | 34.279 | 78.702 |
| | -7.98261554 | 112.6308375 | 453 | -0.007 | 118.01 | 34.222 | 78.696 | 34.221 | 78.693 |



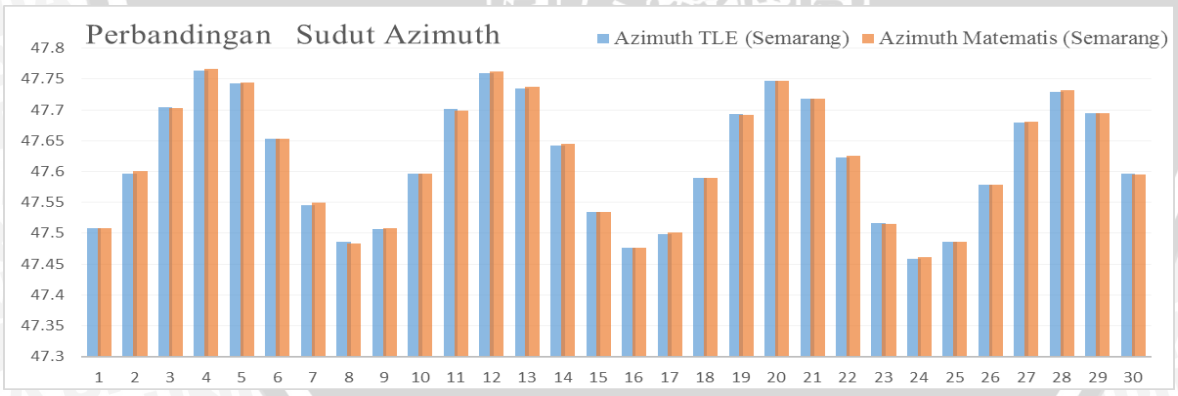



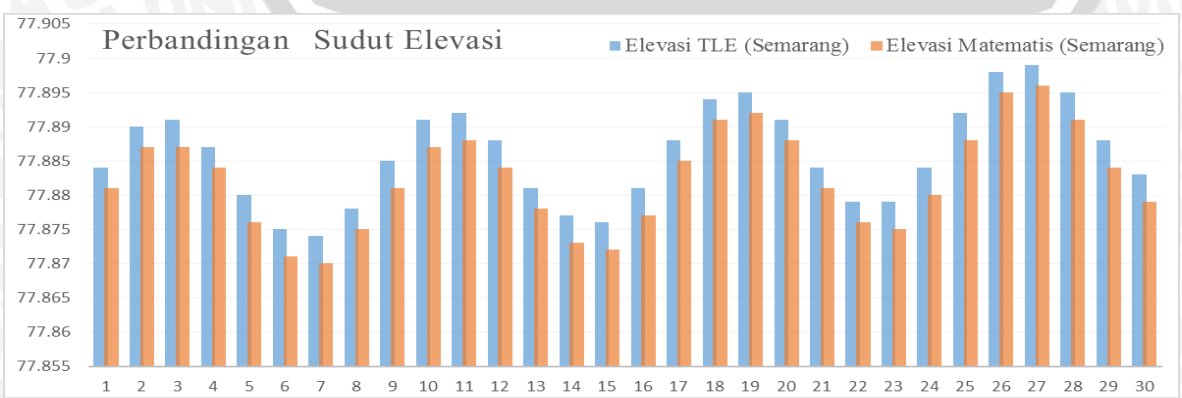
| | SATELIT TELKOM-2 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lokasi Dish Antenna | | | Lokasi satellite | | Perhitngan | | | |
| | Longitude | Latitude | Altitude | Latitude | Longitude | Two Line Elements | | Matematis | |
| | | | | | | Azimuth | Elevasi | Azimuth | Elevasi |
| JAKARTA | -6.175649 | 106.826635 | 4 | 0.018 | 117.998 | 61.376 | 75.01 | 61.375 | 75.005 |
| | -6.175649 | 106.826635 | 4 | 0.005 | 118.003 | 61.437 | 75.012 | 61.438 | 75.008 |
| | -6.175649 | 106.826635 | 4 | -0.011 | 118.014 | 61.525 | 75.009 | 61.525 | 75.005 |
| | -6.175649 | 106.826635 | 4 | -0.02 | 118.025 | 61.587 | 75.003 | 61.585 | 74.999 |
| | -6.175649 | 106.826635 | 4 | -0.018 | 118.03 | 61.586 | 74.997 | 61.588 | 74.993 |
| | -6.175649 | 106.826635 | 4 | -0.004 | 118.025 | 61.524 | 74.995 | 61.522 | 74.99 |
| | -6.175649 | 106.826635 | 4 | 0.011 | 118.014 | 61.436 | 74.998 | 61.438 | 74.993 |
| | -6.175649 | 106.826635 | 4 | 0.02 | 118.002 | 61.375 | 75.005 | 61.376 | 75 |
| | -6.175649 | 106.826635 | 4 | 0.017 | 117.997 | 61.375 | 75.011 | 61.377 | 75.007 |
| | -6.175649 | 106.826635 | 4 | 0.004 | 118.002 | 61.438 | 75.013 | 61.439 | 75.009 |
| | -6.175649 | 106.826635 | 4 | -0.011 | 118.013 | 61.525 | 75.011 | 61.523 | 75.006 |
| | -6.175649 | 106.826635 | 4 | -0.02 | 118.024 | 61.584 | 75.004 | 61.583 | 75 |
| | -6.175649 | 106.826635 | 4 | -0.017 | 118.028 | 61.581 | 74.999 | 61.58 | 74.995 |
| | -6.175649 | 106.826635 | 4 | -0.004 | 118.023 | 61.517 | 74.997 | 61.517 | 74.992 |
| | -6.175649 | 106.826635 | 4 | 0.012 | 118.011 | 61.429 | 75 | 61.428 | 74.995 |
| | -6.175649 | 106.826635 | 4 | 0.02 | 117.999 | 61.368 | 75.007 | 61.369 | 75.003 |
| | -6.175649 | 106.826635 | 4 | 0.017 | 117.995 | 61.371 | 75.014 | 61.372 | 75.009 |
| | -6.175649 | 106.826635 | 4 | 0.003 | 117.999 | 61.435 | 75.017 | 61.437 | 75.013 |
| | -6.175649 | 106.826635 | 4 | -0.012 | 118.01 | 61.521 | 75.014 | 61.52 | 75.01 |
| | -6.175649 | 106.826635 | 4 | -0.021 | 118.021 | 61.578 | 75.008 | 61.58 | 75.004 |
| | -6.175649 | 106.826635 | 4 | -0.017 | 118.025 | 61.572 | 75.002 | 61.573 | 74.998 |
| | -6.175649 | 106.826635 | 4 | -0.003 | 118.019 | 61.505 | 75 | 61.504 | 74.996 |
| | -6.175649 | 106.826635 | 4 | 0.013 | 118.007 | 61.416 | 75.004 | 61.415 | 74.999 |
| | -6.175649 | 106.826635 | 4 | 0.021 | 117.995 | 61.357 | 75.011 | 61.357 | 75.007 |
| | -6.175649 | 106.826635 | 4 | 0.017 | 117.99 | 61.363 | 75.018 | 61.361 | 75.014 |
| | -6.175649 | 106.826635 | 4 | 0.002 | 117.995 | 61.43 | 75.022 | 61.432 | 75.017 |
| | -6.175649 | 106.826635 | 4 | -0.013 | 118.006 | 61.516 | 75.019 | 61.515 | 75.015 |
| | -6.175649 | 106.826635 | 4 | -0.021 | 118.016 | 61.57 | 75.013 | 61.569 | 75.009 |
| | -6.175649 | 106.826635 | 4 | -0.016 | 118.02 | 61.559 | 75.007 | 61.558 | 75.002 |
| | -6.175649 | 106.826635 | 4 | -0.002 | 118.014 | 61.487 | 75.005 | 61.49 | 75 |



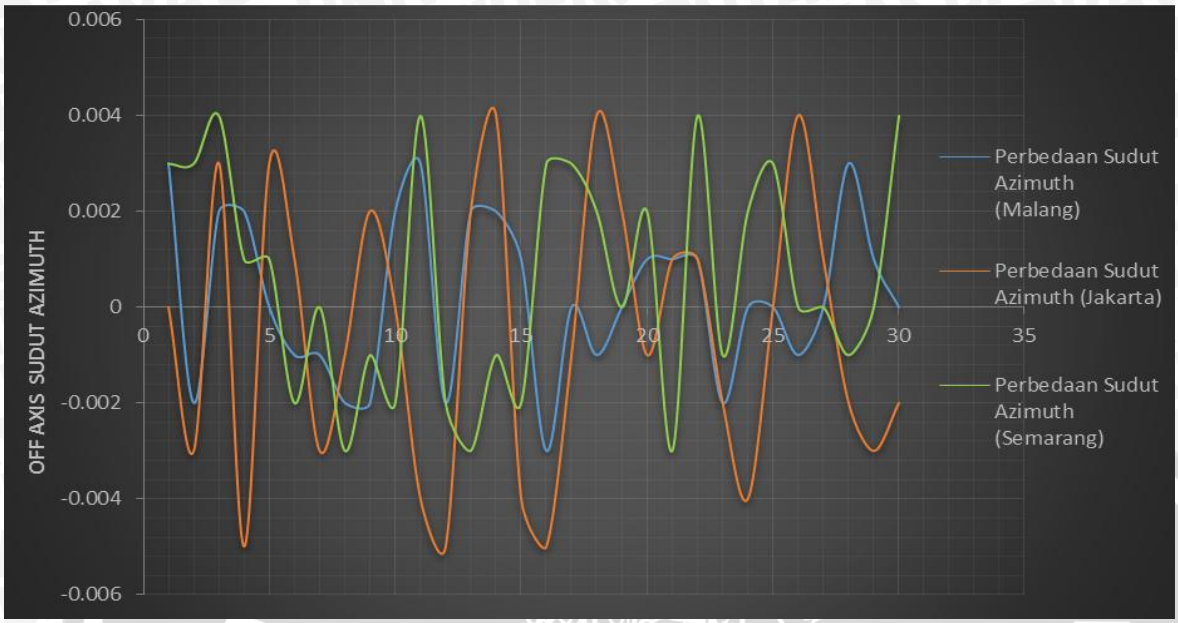
| | SATELIT TELKOM-2 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Lokasi Dish Antenna | | | Lokasi satellite | | Perhitngan | | | |
| | Longitude | Latitude | Altitude | Latitude | Longitude | Two Line Elements | | Matematis | |
| | | | | | | Azimuth | Elevasi | Azimuth | Elevasi |
| SEMARANG | -6.990385 | 110.422951 | 11 | 0.014 | 117.998 | 47.508 | 77.884 | 47.508 | 77.881 |
| | -6.990385 | 110.422951 | 11 | -0.001 | 118.006 | 47.597 | 77.89 | 47.6 | 77.887 |
| | -6.990385 | 110.422951 | 11 | -0.015 | 118.018 | 47.704 | 77.891 | 47.703 | 77.887 |
| | -6.990385 | 110.422951 | 11 | -0.021 | 118.028 | 47.764 | 77.887 | 47.766 | 77.884 |
| | -6.990385 | 110.422951 | 11 | -0.014 | 118.03 | 47.743 | 77.88 | 47.745 | 77.876 |
| | -6.990385 | 110.422951 | 11 | 0.001 | 118.022 | 47.653 | 77.875 | 47.653 | 77.871 |
| | -6.990385 | 110.422951 | 11 | 0.015 | 118.01 | 47.546 | 77.874 | 47.55 | 77.87 |
| | -6.990385 | 110.422951 | 11 | 0.021 | 117.999 | 47.486 | 77.878 | 47.483 | 77.875 |
| | -6.990385 | 110.422951 | 11 | 0.014 | 117.998 | 47.507 | 77.885 | 47.508 | 77.881 |
| | -6.990385 | 110.422951 | 11 | -0.001 | 118.005 | 47.596 | 77.891 | 47.596 | 77.887 |
| | -6.990385 | 110.422951 | 11 | -0.015 | 118.017 | 47.701 | 77.892 | 47.699 | 77.888 |
| | -6.990385 | 110.422951 | 11 | -0.021 | 118.027 | 47.759 | 77.888 | 47.762 | 77.884 |
| | -6.990385 | 110.422951 | 11 | -0.014 | 118.028 | 47.735 | 77.881 | 47.737 | 77.878 |
| | -6.990385 | 110.422951 | 11 | 0.001 | 118.02 | 47.642 | 77.877 | 47.645 | 77.873 |
| | -6.990385 | 110.422951 | 11 | 0.016 | 118.007 | 47.535 | 77.876 | 47.534 | 77.872 |
| | -6.990385 | 110.422951 | 11 | 0.021 | 117.997 | 47.476 | 77.881 | 47.476 | 77.877 |
| | -6.990385 | 110.422951 | 11 | 0.013 | 117.995 | 47.499 | 77.888 | 47.501 | 77.885 |
| | -6.990385 | 110.422951 | 11 | -0.002 | 118.002 | 47.59 | 77.894 | 47.589 | 77.891 |
| | -6.990385 | 110.422951 | 11 | -0.016 | 118.014 | 47.693 | 77.895 | 47.692 | 77.892 |
| | -6.990385 | 110.422951 | 11 | -0.021 | 118.023 | 47.747 | 77.891 | 47.747 | 77.888 |
| | -6.990385 | 110.422951 | 11 | -0.013 | 118.024 | 47.718 | 77.884 | 47.718 | 77.881 |
| | -6.990385 | 110.422951 | 11 | 0.002 | 118.016 | 47.623 | 77.879 | 47.626 | 77.876 |
| | -6.990385 | 110.422951 | 11 | 0.017 | 118.003 | 47.516 | 77.879 | 47.515 | 77.875 |
| | -6.990385 | 110.422951 | 11 | 0.021 | 117.993 | 47.459 | 77.884 | 47.461 | 77.88 |
| | -6.990385 | 110.422951 | 11 | 0.013 | 117.991 | 47.486 | 77.892 | 47.486 | 77.888 |
| | -6.990385 | 110.422951 | 11 | -0.003 | 117.998 | 47.578 | 77.898 | 47.578 | 77.895 |
| | -6.990385 | 110.422951 | 11 | -0.017 | 118.01 | 47.68 | 77.899 | 47.681 | 77.896 |
| | -6.990385 | 110.422951 | 11 | -0.021 | 118.019 | 47.729 | 77.895 | 47.732 | 77.891 |
| | -6.990385 | 110.422951 | 11 | -0.012 | 118.019 | 47.695 | 77.888 | 47.695 | 77.884 |
| | -6.990385 | 110.422951 | 11 | 0.004 | 118.01 | 47.596 | 77.883 | 47.595 | 77.879 |



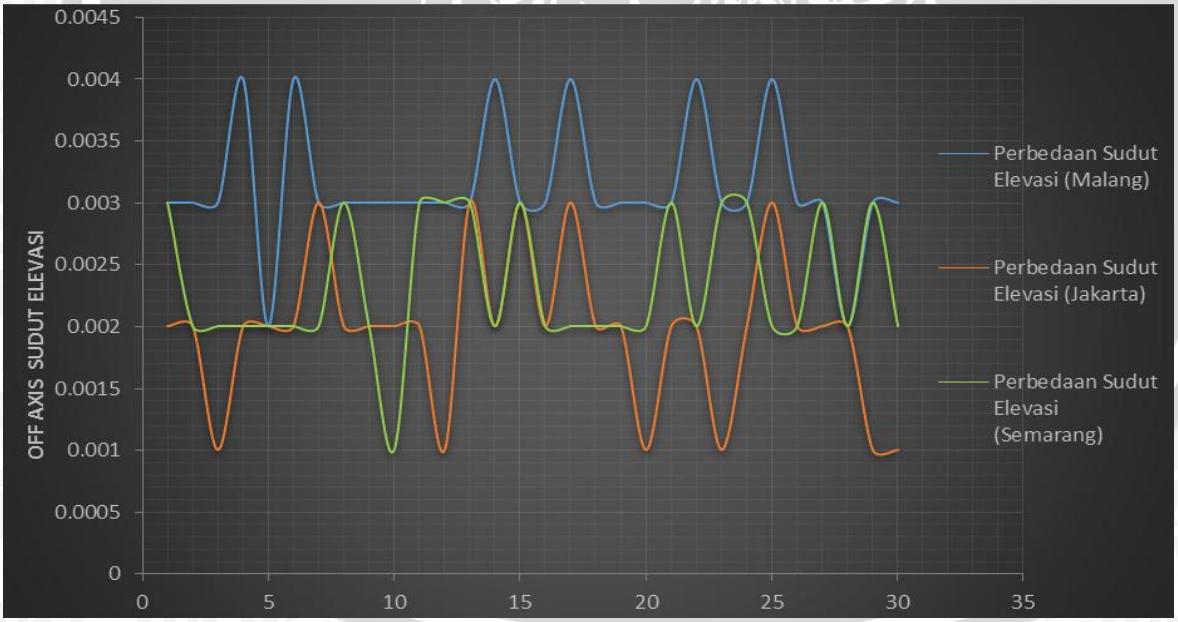



Perbandingan Hasil Perhitungan Sudut Elevasi dan Azimuth dengan Penggunaan TLE dan Perhitungan Matematis Pada Satelit TELKOM-1 Pada Semua Lokasi

| SATELIT TELKOM-1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LOKASI | Perbedaan sudut | | LOKASI | Perbedaan sudut | | LOKASI | Perbedaan sudut | |
| | Azimuth | Elevasi | | Azimuth | Elevasi | | Azimuth | Elevasi |
| MALANG | 0.003 | 0.003 | JAKARTA | 0 | 0.002 | SEMARANG | 0.003 | 0.003 |
| | -0.002 | 0.003 | | -0.003 | 0.002 | | 0.003 | 0.002 |
| | 0.002 | 0.003 | | 0.003 | 0.001 | | 0.004 | 0.002 |
| | 0.002 | 0.004 | | -0.005 | 0.002 | | 0.001 | 0.002 |
| | 0 | 0.002 | | 0.003 | 0.002 | | 0.001 | 0.002 |
| | -0.001 | 0.004 | | 0.001 | 0.002 | | -0.002 | 0.002 |
| | -0.001 | 0.003 | | -0.003 | 0.003 | | 0 | 0.002 |
| | -0.002 | 0.003 | | -0.001 | 0.002 | | -0.003 | 0.003 |
| | -0.002 | 0.003 | | 0.002 | 0.002 | | -0.001 | 0.002 |
| | 0.002 | 0.003 | | 0 | 0.002 | | -0.002 | 0.001 |
| | 0.003 | 0.003 | | -0.004 | 0.002 | | 0.004 | 0.003 |
| | -0.002 | 0.003 | | -0.005 | 0.001 | | -0.002 | 0.003 |
| | 0.002 | 0.003 | | 0.002 | 0.003 | | -0.003 | 0.003 |
| | 0.002 | 0.004 | | 0.004 | 0.002 | | -0.001 | 0.002 |
| | 0.001 | 0.003 | | -0.004 | 0.003 | | -0.002 | 0.003 |
| | -0.003 | 0.003 | | -0.005 | 0.002 | | 0.003 | 0.002 |
| | 0 | 0.004 | | -0.001 | 0.003 | | 0.003 | 0.002 |
| | -0.001 | 0.003 | | 0.004 | 0.002 | | 0.002 | 0.002 |
| | 0 | 0.003 | | 0.002 | 0.002 | | 0 | 0.002 |
| | 0.001 | 0.003 | | -0.001 | 0.001 | | 0.002 | 0.002 |
| | 0.001 | 0.003 | | 0.001 | 0.002 | | -0.003 | 0.003 |
| | 0.001 | 0.004 | | 0.001 | 0.002 | | 0.004 | 0.002 |
| | -0.002 | 0.003 | | -0.002 | 0.001 | | -0.001 | 0.003 |
| | 0 | 0.003 | | -0.004 | 0.002 | | 0.002 | 0.003 |
| | 0 | 0.004 | | 0 | 0.003 | | 0.003 | 0.002 |
| | -0.001 | 0.003 | | 0.004 | 0.002 | | 0 | 0.002 |
| | 0 | 0.003 | | 0.001 | 0.002 | | 0 | 0.003 |
| | 0.003 | 0.002 | | -0.002 | 0.002 | | -0.001 | 0.002 |
| | 0.001 | 0.003 | | -0.003 | 0.001 | | 0 | 0.003 |
| | 0 | 0.003 | | -0.002 | 0.001 | | 0.004 | 0.002 |



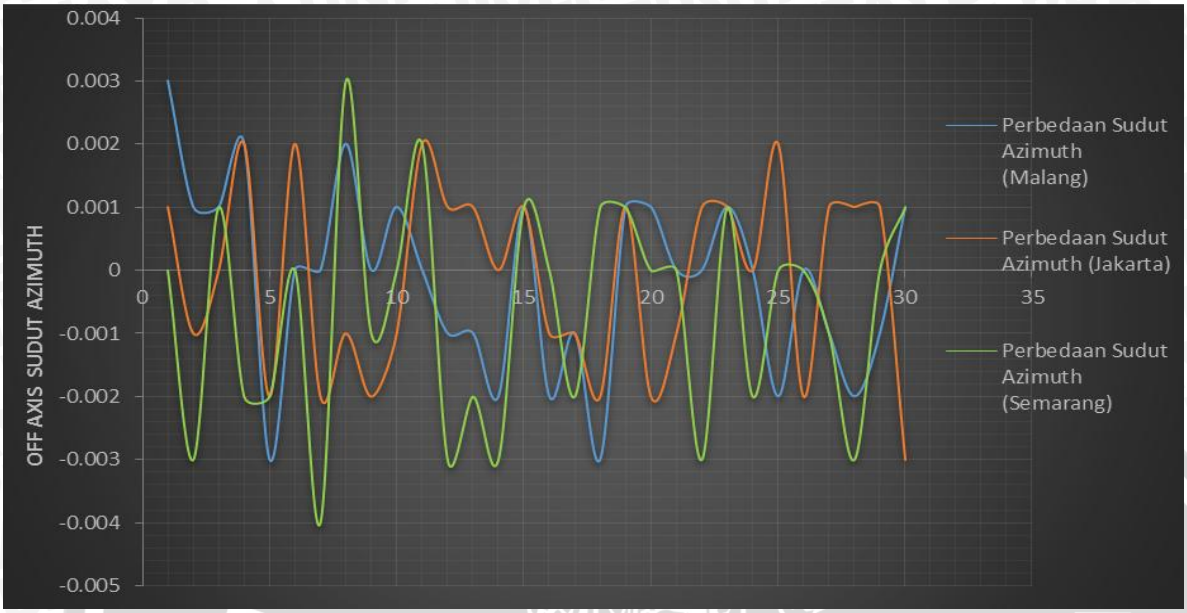

Grafik Perbandingan Hasil Perhitungan Sudut Azimuth dengan Penggunaan TLE dan Perhitungan Matematis Pada Satelit TELKOM-1 Pada Semua Lokasi



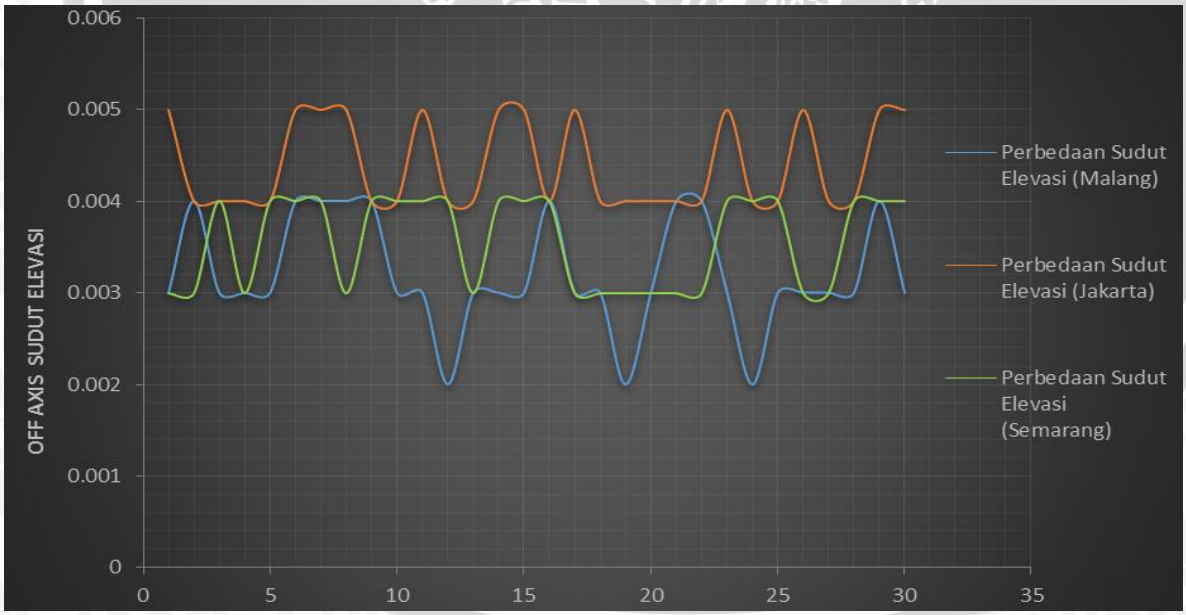

Grafik Perbandingan Hasil Perhitungan Sudut Elevasi dengan Penggunaan TLE dan Perhitungan Matematis Pada Satelit TELKOM-1 Pada Semua Lokasi

Perbandingan Hasil Perhitungan Sudut Elevasi dan Azimuth dengan Penggunaan TLE dan Perhitungan Matematis Pada Satelit TELKOM-2 Pada Semua Lokasi

| SATELIT TELKOM-2 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LOKASI | Perbedaan sudut | | LOKASI | Perbedaan sudut | | LOKASI | Perbedaan sudut | |
| | Azimuth | Elevasi | | Azimuth | Elevasi | | Azimuth | Elevasi |
| MALANG | 0.003 | 0.003 | JAKARTA | 0.001 | 0.005 | SEMARANG | 0 | 0.003 |
| | 0.001 | 0.004 | | -0.001 | 0.004 | | -0.003 | 0.003 |
| | 0.001 | 0.003 | | 0 | 0.004 | | 0.001 | 0.004 |
| | 0.002 | 0.003 | | 0.002 | 0.004 | | -0.002 | 0.003 |
| | -0.003 | 0.003 | | -0.002 | 0.004 | | -0.002 | 0.004 |
| | 0 | 0.004 | | 0.002 | 0.005 | | 0 | 0.004 |
| | 0 | 0.004 | | -0.002 | 0.005 | | -0.004 | 0.004 |
| | 0.002 | 0.004 | | -0.001 | 0.005 | | 0.003 | 0.003 |
| | 0 | 0.004 | | -0.002 | 0.004 | | -0.001 | 0.004 |
| | 0.001 | 0.003 | | -0.001 | 0.004 | | 0 | 0.004 |
| | 0 | 0.003 | | 0.002 | 0.005 | | 0.002 | 0.004 |
| | -0.001 | 0.002 | | 0.001 | 0.004 | | -0.003 | 0.004 |
| | -0.001 | 0.003 | | 0.001 | 0.004 | | -0.002 | 0.003 |
| | -0.002 | 0.003 | | 0 | 0.005 | | -0.003 | 0.004 |
| | 0.001 | 0.003 | | 0.001 | 0.005 | | 0.001 | 0.004 |
| | -0.002 | 0.004 | | -0.001 | 0.004 | | 0 | 0.004 |
| | -0.001 | 0.003 | | -0.001 | 0.005 | | -0.002 | 0.003 |
| | -0.003 | 0.003 | | -0.002 | 0.004 | | 0.001 | 0.003 |
| | 0.001 | 0.002 | | 0.001 | 0.004 | | 0.001 | 0.003 |
| | 0.001 | 0.003 | | -0.002 | 0.004 | | 0 | 0.003 |
| | 0 | 0.004 | | -0.001 | 0.004 | | 0 | 0.003 |
| | 0 | 0.004 | | 0.001 | 0.004 | | -0.003 | 0.003 |
| | 0.001 | 0.003 | | 0.001 | 0.005 | | 0.001 | 0.004 |
| | 0 | 0.002 | | 0 | 0.004 | | -0.002 | 0.004 |
| | -0.002 | 0.003 | | 0.002 | 0.004 | | 0 | 0.004 |
| | 0 | 0.003 | | -0.002 | 0.005 | | 0 | 0.003 |
| | -0.001 | 0.003 | | 0.001 | 0.004 | | -0.001 | 0.003 |
| | -0.002 | 0.003 | | 0.001 | 0.004 | | -0.003 | 0.004 |
| | -0.001 | 0.004 | | 0.001 | 0.005 | | 0 | 0.004 |
| | 0.001 | 0.003 | | -0.003 | 0.005 | | 0.001 | 0.004 |



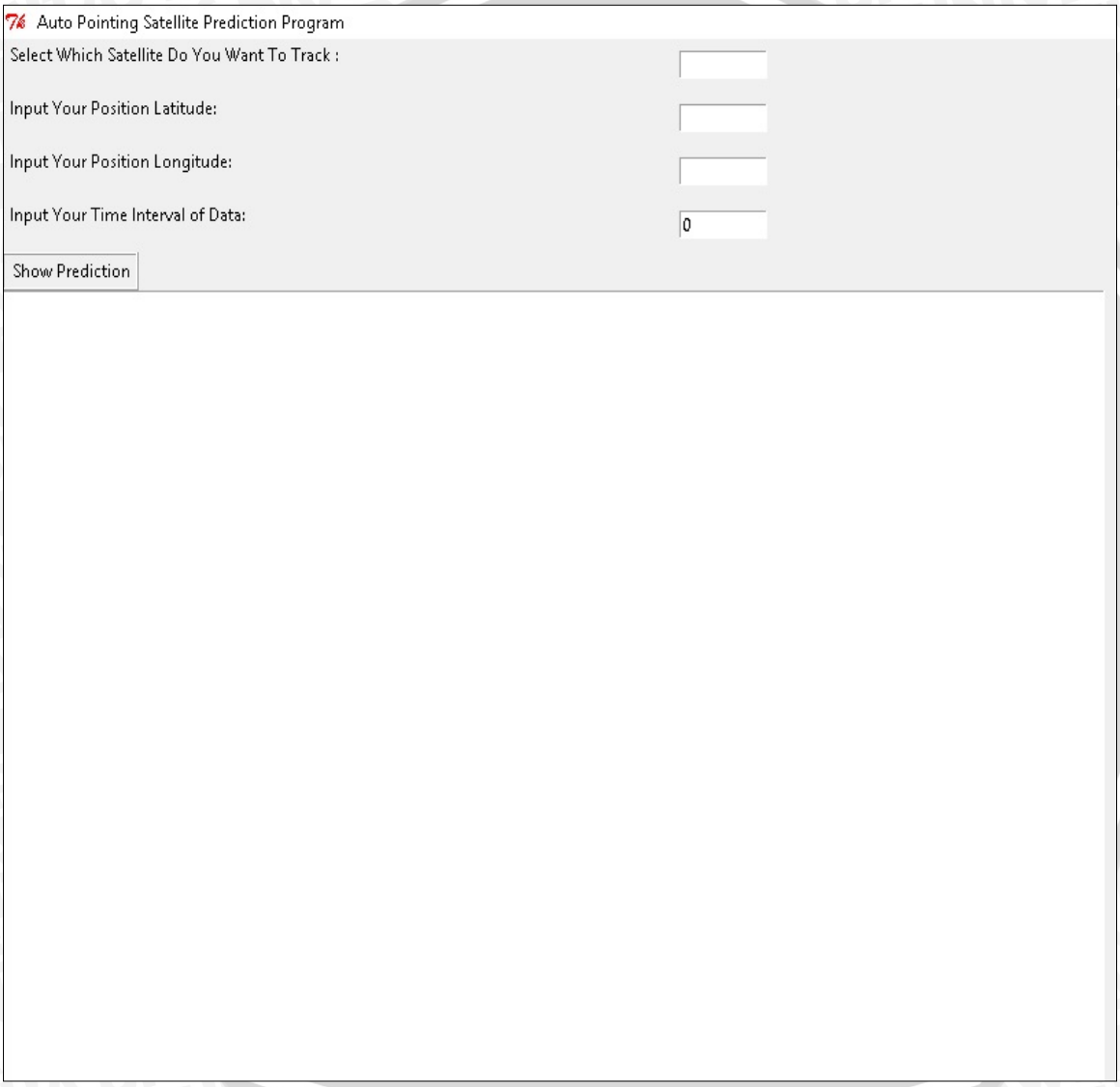

Grafik Perbandingan Hasil Perhitungan Sudut Azimuth dengan Penggunaan TLE dan Perhitungan Matematis Pada Satelit TELKOM-2 Pada Semua Lokasi



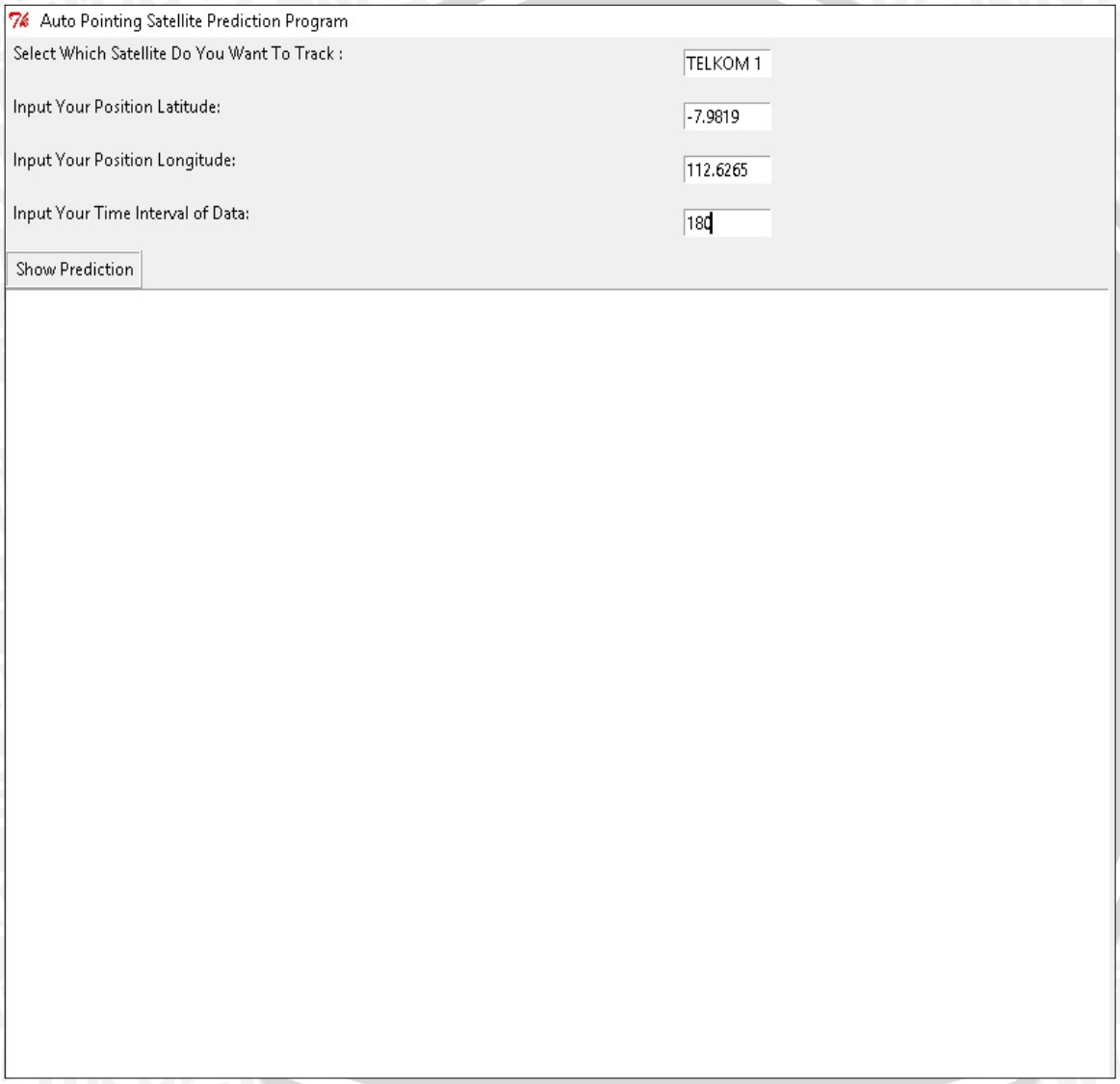

Grafik Perbandingan Hasil Perhitungan Sudut Elevasi dengan Penggunaan TLE dan Perhitungan Matematis Pada Satelit TELKOM-2 Pada Semua Lokasi

*user interface program TLE*

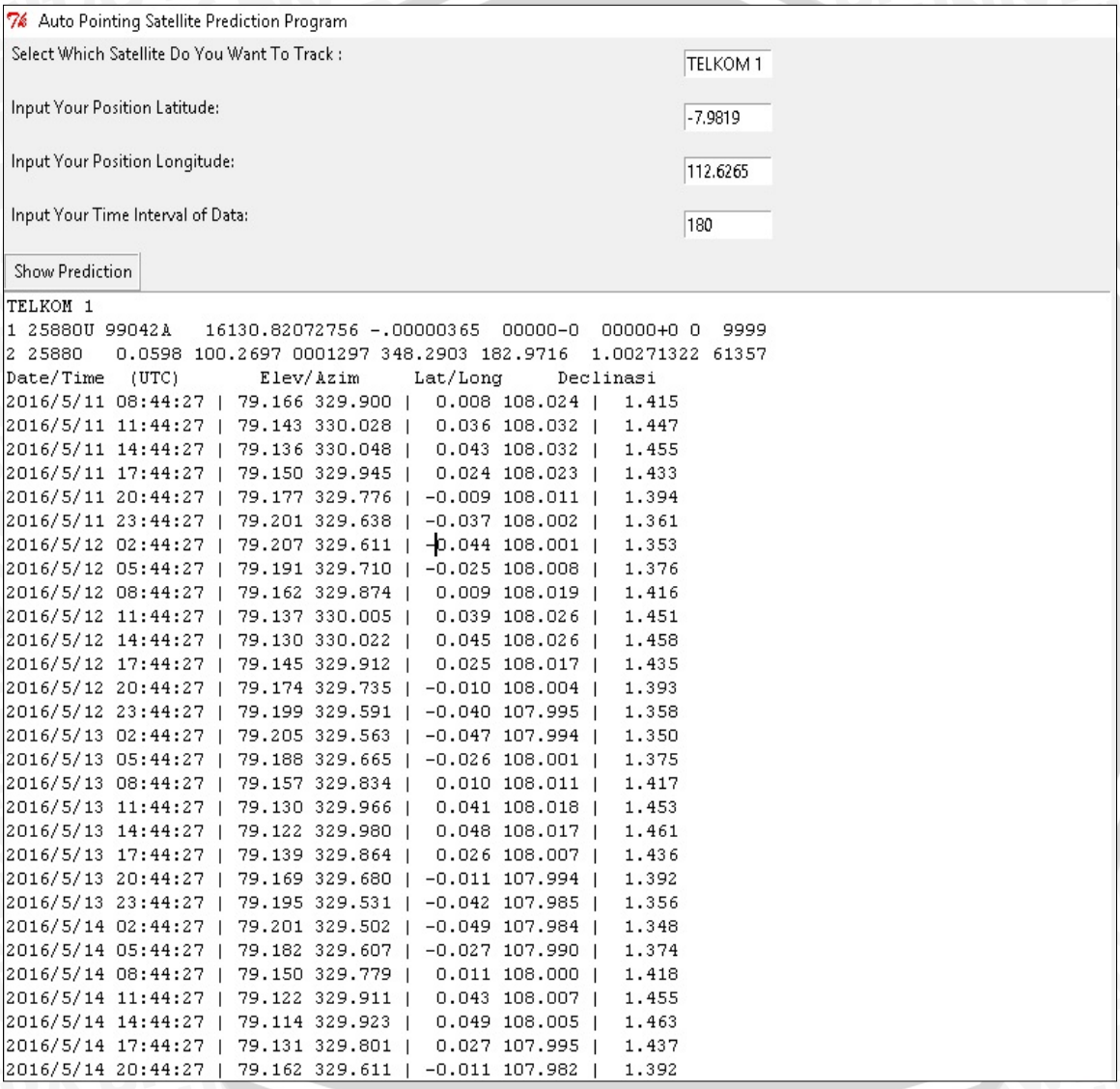
Tampilan GUI pengambilan data menggunakan TLE pada bahasa pemrogaman python



Penentuan parameter pada proses pengambilan data menggunakan TLE pada bahasa pemrogaman python



Hasil proses pengambilan data menggunakan TLE pada bahasa pemrogaman python.




```
TELKOM 1
1 25880U 99042A   16130.82072756 -.00000365  00000-0  00000+0 0  9999
2 25880   0.0598 100.2697 0001297 348.2903 182.9716  1.00271322 61357
Date/Time  (UTC)        Elev/Azim     Lat/Long     Declinasi
2016/5/11 08:44:27 | 79.166 329.900 |  0.008 108.024 |  1.415
2016/5/11 11:44:27 | 79.143 330.028 |  0.036 108.032 |  1.447
2016/5/11 14:44:27 | 79.136 330.048 |  0.043 108.032 |  1.455
2016/5/11 17:44:27 | 79.150 329.945 |  0.024 108.023 |  1.433
2016/5/11 20:44:27 | 79.177 329.776 | -0.009 108.011 |  1.394
2016/5/11 23:44:27 | 79.201 329.638 | -0.037 108.002 |  1.361
2016/5/12 02:44:27 | 79.207 329.611 | -0.044 108.001 |  1.353
2016/5/12 05:44:27 | 79.191 329.710 | -0.025 108.008 |  1.376
2016/5/12 08:44:27 | 79.162 329.874 |  0.009 108.019 |  1.416
2016/5/12 11:44:27 | 79.137 330.005 |  0.039 108.026 |  1.451
2016/5/12 14:44:27 | 79.130 330.022 |  0.045 108.026 |  1.458
2016/5/12 17:44:27 | 79.145 329.912 |  0.025 108.017 |  1.435
2016/5/12 20:44:27 | 79.174 329.735 | -0.010 108.004 |  1.393
2016/5/12 23:44:27 | 79.199 329.591 | -0.040 107.995 |  1.358
2016/5/13 02:44:27 | 79.205 329.563 | -0.047 107.994 |  1.350
2016/5/13 05:44:27 | 79.188 329.665 | -0.026 108.001 |  1.375
2016/5/13 08:44:27 | 79.157 329.834 |  0.010 108.011 |  1.417
2016/5/13 11:44:27 | 79.130 329.966 |  0.041 108.018 |  1.453
2016/5/13 14:44:27 | 79.122 329.980 |  0.048 108.017 |  1.461
2016/5/13 17:44:27 | 79.139 329.864 |  0.026 108.007 |  1.436
2016/5/13 20:44:27 | 79.169 329.680 | -0.011 107.994 |  1.392
2016/5/13 23:44:27 | 79.195 329.531 | -0.042 107.985 |  1.356
2016/5/14 02:44:27 | 79.201 329.502 | -0.049 107.984 |  1.348
2016/5/14 05:44:27 | 79.182 329.607 | -0.027 107.990 |  1.374
2016/5/14 08:44:27 | 79.150 329.779 |  0.011 108.000 |  1.418
2016/5/14 11:44:27 | 79.122 329.911 |  0.043 108.007 |  1.455
2016/5/14 14:44:27 | 79.114 329.923 |  0.049 108.005 |  1.463
2016/5/14 17:44:27 | 79.131 329.801 |  0.027 107.995 |  1.437
2016/5/14 20:44:27 | 79.162 329.611 | -0.011 107.982 |  1.392
```

*Listing program TLE* dan *user interface program TLE* untuk mendapatkan sudut azimuth dan elevasi

```
import time
import urllib
from Tkinter import*
import ephem
import sys
import math
import numpy
import datetime
import tkMessageBox

#welcoming the user
gui1 = Tk()
gui1.title(" Auto Pointing Satellite Prediction Program")
gui1.geometry("600x600")

satellite= StringVar()
latitude =  StringVar()
longitude = StringVar()
interval = IntVar()

#hasil1 = StringVar()
angle = float(0.785)
def result():
    content1 = satellite.get()
    content2 = latitude.get()
    content3 = longitude.get()
    content4 = interval.get()
    htmlfile  = urllib.urlopen('http://www.celestrak.com/NORAD/elements/geo.txt')
    x = htmlfile.read()
    ref = x.find(content1)

    #full_ref = x[ref:ref+167]
    full_ref = x[ref:ref+167]
    ref1 = full_ref.find('\r\n1')
    ref2 = full_ref.find('\r\n2')
    line1 = full_ref.__getslice__(ref1+2, ref1+72)
    line2 = full_ref.__getslice__(ref2+2, ref2+72)
    print '\nThe data that will be calculated\n',line1,'\n',line2,'\n'
    save1 = open('ISS_2.txt', 'w')
    save1.write(full_ref)
    save1.close()
    iss = ephem.readtle(full_ref,line1, line2 )
    obs         = ephem.Observer()
    obs.lat     = str(content2)
    obs.long  = str(content3)
    obs.date  = ephem.Date(datetime.datetime.utcnow())
```

```
        #iss.compute(obs)
        print """\nDate/Time  (UTC)      Elev/Azim     Lat/Long     Declinasi"""
        print """=========================================="""
        hasil1.insert(INSERT,full_ref)
        hasil1.insert(INSERT,"""\nDate/Time  (UTC)      Elev/Azim     Lat/Long
Declinasi\n""","==========================================")
        for i in range(50):
            obs.date += ephem.minute * content4
            iss.compute(obs)
            calculation= "%s | %6.3f %6.3f | %6.3f %6.3f | %6.3f" '\n' % \
                  (ephem.Date(obs.date),
                   math.degrees(iss.alt),
                   math.degrees(iss.az),
                   math.degrees(iss.sublat),
                   math.degrees(iss.sublong),
                   math.degrees(iss.dec))
            hasil1.insert(INSERT, calculation)
            print calculation
            save1 = open('SKRIPSI.txt','w')
            save1.write('\n')
            save1.close()

        #satellite
satellite1 = Label(gui1)
satellite1.grid(row = 2, column = 0, sticky = W)
satellite1['text']=' Select Which Satellite Do You Want To Track :\n'
input2 =  Entry(gui1, width = 10, textvariable = satellite)
input2.grid(row = 2, column =1)
        #latitude
latitude1 = Label(gui1)
latitude1.grid(row = 3, column = 0, sticky = W)
latitude1['text']=' Input Your Position Latitude:\n'
input3 =  Entry(gui1, width = 10, textvariable = latitude)
input3.grid(row = 3, column =1)
      #longitude
longitude1 = Label(gui1)
longitude1.grid(row = 4, column = 0, sticky = W)
longitude1['text']=' Input Your Position Longitude:\n'
input4 =  Entry(gui1, width = 10, textvariable = longitude)
input4.grid(row = 4, column =1)
      #interval
interval1 = Label(gui1)
interval1.grid(row = 5, column = 0, sticky = W)
interval1['text']=' Input Your Time Interval of Data:\n'
input5 =  Entry(gui1, width = 10, textvariable = interval)
input5.grid(row = 5, column =1)
     #tombol calculate
button1 = Button(gui1, command = result, relief = RIDGE)
button1['text'] = ' Show Prediction'
button1.grid(row = 6, column = 0, sticky = W)
```

```
hasil1 = Text(gui1, height = 100, width =100)
hasil1.grid(row = 8, columnspan =3)
gui1.mainloop()
```

Data sekunder yang digunakan dalam penelitian:

Perhitungan *link Budget downlink* satelit TELKOM-1 dengan pergeseran sudut *pointing* azimuth

| *Off-axis* | Rx level | *Gain Rx* | $G/T_{dn}$ | $C/N_{dn}$ | $C/N_{total}$ | Eb/No | BER |
|---|---|---|---|---|---|---|---|
| -0.8 | -72,56942 | 24,50158 | 2,7098 | 30,5988 | 23,8537 | -9,260 | $<<1x10^{-1}$ |
| -0.6 | -55,56942 | 41,50158 | 19,7098 | 47,5988 | 33,0578 | -0,0555 | $<1x10^{-1}$ |
| -0.4 | -56,56942 | 40,50158 | 18,7098 | 46,5988 | 32,5723 | -0,541 | $<1x10^{-1}$ |
| -0.2 | -49,56942 | 47,50158 | 27,7098 | 53,5988 | 35,8445 | 2,7312 | $\pm 1x10^{-2}$ |
| 0 | -44,56942 | 52,50158 | 30,7098 | 58,5988 | 38,0133 | 4,9 | $1x10^{-9}$ |
| 0.2 | -48,56942 | 48,50158 | 26,7098 | 54,5988 | 36,2890 | 3,1757 | $\pm 1x10^{-5}$ |
| 0.4 | -59,56942 | 37,50158 | 16,7098 | 44,5988 | 31,5823 | -1,5310 | $<1x10^{-1}$ |
| 0.6 | -59,56942 | 37,50158 | 16,7098 | 44,5988 | 31,5823 | -1,5310 | $<1x10^{-1}$ |
| 0.8 | -69,56942 | 27,50158 | 6,7098 | 34,5988 | 26,2165 | -6,8968 | $<<1x10^{-1}$ |

Perhitungan *link Budget downlink* satelit TELKOM-1 dengan pergeseran sudut *pointing* elevasi

| *Off-axis* | Rx level | *Gain Rx* | $G/T_{dn}$ | $C/N_{dn}$ | $C/N_{total}$ | Eb/No | BER |
|---|---|---|---|---|---|---|---|
| -0.8 | -69.56942 | 27.50158 | 5.7098 | 33.5988 | 23.6383 | -9.475 | $<<1x10^{-1}$ |
| -0.6 | -60.56942 | 36.50158 | 14.7098 | 42.5988 | 30.5661 | -2.5472 | $<1x10^{-1}$ |
| -0.4 | -57.56942 | 39.50158 | 17.7098 | 45.5988 | 32.0805 | -1.0328 | $<1x10^{-1}$ |
| -0.2 | -49.56942 | 47.50158 | 27.7098 | 53.5988 | 35.8445 | 2.7312 | $\pm 1x10^{-2}$ |
| 0 | -44.56942 | 52.50158 | 30.7098 | 58.5988 | 38.0133 | 4.9000 | $1x10^{-9}$ |
| 0.2 | -54.56942 | 40.50158 | 18.7098 | 46.5988 | 32.5772 | -0.541 | $<1x10^{-1}$ |
| 0.4 | -69.56942 | 27.50158 | 5.7098 | 33.5988 | 25.6383 | -7.475 | $<1x10^{-1}$ |
| 0.6 | -58.56942 | 38.50158 | 16.7098 | 44.5988 | 31.5823 | -1.531 | $<1x10^{-1}$ |
| 0.8 | -79.56942 | 17.50158 | -4.2902 | 23.5988 | 19.3738 | -13.7395 | $<<1x10^{-1}$ |

Perhitungan *link Budget downlink* satelit TELKOM-2 dengan pergeseran sudut *pointing* azimuth

| *Off-axis* | Rx level | *Gain Rx* | $G/T_{dn}$ | $C/N_{dn}$ | $C/N_{total}$ | Eb/No | BER |
|---|---|---|---|---|---|---|---|
| -0.8 | -68,5755 | 27,5005 | 5,7086 | 33,5927 | 25,4487 | -7,6646 | $<<1x10^{-1}$ |
| -0.6 | -59,5755 | 36,5005 | 14,7086 | 43,5927 | 30,8014 | -2,3119 | $<<1x10^{-1}$ |
| -0.4 | -56,5755 | 39,5005 | 17,7086 | 46,5927 | 32,2696 | -0,8437 | $<1x10^{-1}$ |
| -0.2 | -48,5755 | 47,5005 | 25,7086 | 54,5927 | 35,9146 | 2,8013 | $\pm 1x10^{-2}$ |
| 0 | -43,5755 | 52,50158 | 30,7098 | 59,594 | 38,0133 | 4,9 | $1x10^{-9}$ |
| 0.2 | -53,5755 | 42,5005 | 20,7086 | 49,5927 | 34,0821 | 0,9688 | $<1x10^{-1}$ |
| 0.4 | -68,5755 | 27,5005 | 5,7086 | 33,5927 | 25,4487 | -7,6646 | $<<1x10^{-1}$ |
| 0.6 | -57,5755 | 38,5005 | 16,7086 | 45,5927 | 31,7866 | -1,3267 | $<1x10^{-1}$ |
| 0.8 | -78,5755 | 17,5005 | -4,2913 | 24,5927 | 19,9247 | -13,1886 | $<<1x10^{-1}$ |

Perhitungan *link Budget downlink* satelit TELKOM-2 dengan pergeseran sudut *pointing* elevasi

| *Off-axis* | Rx level | *Gain Rx* | $G/T_{dn}$ | $C/N_{dn}$ | $C/N_{total}$ | Eb/No | BER |
|---|---|---|---|---|---|---|---|
| -0.8 | -71,5755 | 24,5005 | 2,7086 | 31,5927 | 24,2841 | -8,8292 | $<<1x10^{-1}$ |
| -0.6 | -54,5755 | 41,5005 | 19,7086 | 48,5927 | 33,2164 | 0,1031 | $<1x10^{-1}$ |
| -0.4 | -55,5755 | 40,5005 | 18,7086 | 47,5927 | 32,7461 | -0,3672 | $<1x10^{-1}$ |
| -0.2 | -48,5755 | 47,5005 | 25,7086 | 54,5927 | 35,9146 | 2,8013 | $\pm 1x10^{-2}$ |
| 0 | -43,5755 | 52,50158 | 30,7098 | 59,594 | 38,0133 | 4,9 | $1x10^{-9}$ |
| 0.2 | -47,5755 | 48,5005 | 26,7086 | 55,5927 | 36,3447 | 3,2313 | $\pm 1x10^{-4}$ |
| 0.4 | -58,5755 | 37,5005 | 15,7086 | 44,5927 | 31,2974 | -1,8159 | $<1x10^{-1}$ |
| 0.6 | -58,5755 | 37,5005 | 15,7086 | 44,5927 | 31,2974 | -1,8159 | $<1x10^{-1}$ |
| 0.8 | -68,5755 | 26,5005 | 5,7086 | 34,5927 | 26,0185 | -7,0948 | $<<1x10^{-1}$ |