

Partial Derivatives

From N34°/E30°

mid-point

Intervals Δ

10° Lat 10° Lon 20 min UT

N39°/E30°/UT 02:15
 $\theta = -10.6$ S 5.173/97.2 ~~6.093/97.3~~
 $\sqrt{8.761/95.9}$
 SV 330.9 SM 326.9 V-M +4.0

$\frac{\partial SV}{\partial Lat} = +9.8$ $\frac{\partial SM}{\partial Lat} = +15.1$
 $\frac{\partial SV}{\partial Lon} = -10$ $\frac{\partial SM}{\partial Lon} = -10$

N34°/E25°/UT 02:15
 $\theta = -16.5$ S 1.873/94.6 ~~2.690/93.8~~
 $\sqrt{5.170/92.3}$
 SV 325.1 SM 315.6 V-M +9.5

N34°/E30°/UT 02:15
 $\theta = -12.9$ S 5.822/97.4 ~~6.693/96.7~~
 $\sqrt{9.241/95.2}$
 SV 327.2 SM 321.2 V-M +6.0

N34°/E35°/UT 02:15
 $\theta = -9.1$ S 9.863/100.3 ~~10.761/99.1~~
 $\sqrt{13.330/98.1}$
 SV 327.6 SM 322.1 V-M +5.5

$\frac{\partial SV}{\partial Lon} = -2.5$ $\frac{\partial SM}{\partial Lon} = -6.5$
 $\frac{\partial SV}{\partial Lat} = 10$ $\frac{\partial SM}{\partial Lat} = 10$

N29°/E30°/UT 02:15
 $\theta = -15.0$ S 6.432/96.9 M 7.237/96.0
 $\sqrt{9.652/94.3}$
 SV 321.1 SM 311.8 V-M 9.3

$\frac{\partial SV}{\partial UT} = +1.6$ $\frac{\partial SM}{\partial UT} = -5.6$
 $\frac{\partial SV}{\partial UT} = 9.0 \text{ min}$ $\frac{\partial SM}{\partial UT} = 9.0 \text{ min}$

N34°/E30°/UT 02:05
 $\theta = -14.7$ S 3.817/96.0 ~~4.713/95.3~~
 $\sqrt{7.196/93.7}$
 SV 325.8 SM 322.0 V-M +3.8

N34°/E30°/UT 02:15
 $\theta = -12.9$ S 5.822/97.4 ~~6.693/96.7~~
 $\sqrt{9.241/95.2}$
 SV 327.2 SM 321.2 V-M +6.0

N34°/E30°/UT 02:25
 $\theta = -11.0$ S 7.844/98.8 ~~8.685/98.1~~
 $\sqrt{11.289/96.6}$
 SV 327.4 SM 316.4 V-M +11.1

From CAIRO N34°/E30°/UT 02:15 to IZMIR N38°23'/E027°16'/02°35'30"

$\Delta Lat = +4.3833$	$\Delta Lon = +2.7333$	$\Delta UT = 20.5 \text{ min}$	$+5.8674$
SSV $\Delta SSV = +4.2957$	-0.0683	$+1.640 + 3.2800$	$\Delta SV = +7.5074$
SSM $\Delta SSM = +6.6188$	-1.1767	$-5.740 - 11.4800$	$\Delta SM = -6.0379$
			-0.2979

Values derived from CAIRO \rightarrow SV + $\Delta SV = 333.1$ \leftarrow SM + $\Delta SM = 320.9$
 334.7074 315.1621

IZMIR Actual values \rightarrow

IZMIR N38.38333/E027.26667/UT=02°35'30"

$\theta = -9.9$ S 7.083/99.3 ~~7.934/98.6~~ V 10.676/97.4

SV 332.1 SM 320.6 V-M +11.6

$\frac{\partial Lat}{\partial SV} = 10/9.8 = 1.0$ $\frac{\partial Lat}{\partial SM} = 10/15.1 = 0.7$ $\frac{\partial Lon}{\partial SV} = -4$ $\frac{\partial Lon}{\partial SM} = -10/6.5 = 1.5$

$\frac{\partial UT}{\partial SV} = \frac{20}{1.6} = 12.5 \text{ min/°}$ $\frac{\partial UT}{\partial SM} = \frac{-20}{5.6} = 3.6 \text{ min/°}$



Apr 29th 2025