

COMPARISON model JPL-DE441 3500-2200-1800-500 Sun-Moon-Planet
 update: 28 nov 2021 variant alm106d

Comparison of AstroAlmanac106d.htm (see also Astronavig-V13d.c)
 with: JPL-Horizons JPL-Model DE441.

The difference "diff arcsec" is defined as: = [JPL-Horizons] - [AstroAlmanac], etc.
 Note that Rectascension-values (RA) must be multiplied by 15 to convert from Seconds to ArcSeconds.
 Relation between Greenwich Hour Angle (GHA) and Right Ascension (RA), involving
 Greenwich apparent Sidereal Time (GAST = also: hour angle of ARIES-point): $GHA=(GAST-RA)*15+360$.

dtr= 0,01745	=degrees-to-radians conversion
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3500 =Year date = 1 April, time = 00h00

### JPL-HORIZONS ###	JD=2999498,5	#####
Delta-T=	69.18	defined by JPL-Horizons !!!
		ONE-Digit Precision!
SUN	Rectascension	diff arcsec
	hour min sec	DECLINATION
		deg arcmin arcsec
JPL-Horizons	0 40 46,36	----
Alm-106d-DE441	0 40 46,37	-0,15
		4 20 49,2
		4 20 49,2 0,0
MOON	Rectascension	diff arcsec
	hour min sec	DECLINATION
		deg arcmin arcsec
JPL-Horizons	7 24 53,15	----
Alm-106d-DE441	7 24 53,11	0,56
		19 58 23,7
		19 58 21,1 2,6
Venus	Rectascension	diff arcsec
	hour min sec	DECLINATION
		deg arcmin arcsec
JPL-Horizons	1 51 22,63	----
Alm-106d-DE441	1 51 22,64	-0,15
		10 23 50,0
		10 23 50,0 0,0

ARIES	GAST	diff arcsec
	hour min sek	
JPL	12 37 54,16	
AstroAlm105	12 37 54,33	-2,59

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2200 =year 1 April 0h00

### JPL-HORIZONS ###	JD=2524683,5	#####
Delta-T=	69.18	defined by JPL-Horizons !!!
		ONE-Digit Precision!
SUN	Rectascension	diff arcsec
	hour min sec	DECLINATION
		deg arcmin arcsec
JPL-Horizons	0 40 55,84	----
Alm-106d-DE441	0 40 55,85	-0,15
		4 23 53,7
		4 23 53,8 -0,1
MOON	Rectascension	diff arcsec
	hour min sec	DECLINATION
		deg arcmin arcsec

JPL-Horizons	12	54	45,25	----	-7	21	45,7	----
Alm-106d-DE441	12	54	45,27	-0,30	7	21	45,7	0,0

Venus	Rectascension				diff arcsec	DEClination			diff "
	hour	min	sec			deg	arcm	arcsec	
JPL-Horizons	0	28	25,78	----		1	32	42,6	----
Alm-106d-DE441	0	28	25,79	-0,15		1	32	42,7	-0,1

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1800 =year 1 April 0h00

### JPL-HORIZONS ###	JD=2378586,5	#####							
Delta-T=	18,535	defined by JPL-Horizons !!!				ONE-Digit Precision!			
SUN	Rectascension				diff arcsec	DEClination			diff "
	hour	min	sec			deg	arcm	arcsec	
JPL-Horizons	0	40	33,36	----		4	22	13,9	----
Alm-106d-DE441	0	40	33,36	0,00		4	22	13,9	0,0

MOON	Rectascension				diff arcsec	DEClination			diff "
	hour	min	sec			deg	arcm	arcsec	
JPL-Horizons	5	33	3,15	----		27	43	38,1	----
Alm-106d-DE441	5	33	3,25	-1,33		27	43	38,2	-0,1

Venus	Rectascension				diff arcsec	DEClination			diff "
	hour	min	sec			deg	arcm	arcsec	
JPL-Horizons	22	41	29,24	----		-9	27	39,9	----
Alm-106d-DE441	22	41	29,24	0,00		-9	27	39,9	0,0

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500 =year 1 April 0h00

### JPL-HORIZONS ###	JD=1903773,5	#####							
Delta-T=	5606,6	defined by JPL-Horizons !!!				ONE-Digit Precision!			
SUN	Rectascension				diff arcsec	DEClination			diff "
	hour	min	sec			deg	arcm	arcsec	
JPL-Horizons	0	47	14,74	----		5	7	6,4	----
Alm-106d-DE441	0	47	14,76	-0,30		5	7	6,6	-0,2

MOON	Rectascension				diff arcsec	DEClination			diff "
	hour	min	sec			deg	arcm	arcsec	
JPL-Horizons	13	8	52,91	----		-11	27	36,2	----
Alm-106d-DE441	13	8	52,85	0,88		-11	27	35,7	0,5

Venus	Rectascension				diff arcsec	DEClination			diff "
	hour	min	sec			deg	arcm	arcsec	
JPL-Horizons	21	55	58,25	----		-12	31	53,3	----
Alm-106d-DE441	21	55	58,28	-0,44		-12	31	53,2	0,1

COMPARISON STARS 3500-2200-1800-1500-1000-500- Moshier

of MOSHIER with Almanac106 as well as ICE51 (1820-2045)

(There is one Digit less displayed in AstroAlmanac comp. To Moshier)

NOTE: originally same results for N-Almac-v01, U34 and AstroAlmanac102.

Alm105: improved handling of Rigil Kentaurus and other stars in proximity of sun.

ICE= Interactive Computer ephemeris 0.51, by US Naval Observatory.

Moshier= aa56.exe by www.moshier.net

AstroAlmanac105.htm (..106.html)

All differences are like: RA(Moshier) - RA(Astroalm) etc.

Note: the realistic GREEN differences are like: $\text{diff_RA} \cdot \cos(\text{DEC})$ in arcseconds!

Those must be taken for declinations larger than +60 degrees.

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$0,017453293 = \text{deg2rad}$

3500 =Year date = 1 july, time = 00h00

Star	3500	=Year	date = 1 july, time = 00h00											
Polaris	Delta-T=	00.00				0,01745	=dtr							
	58	Rectascension	diff arcsec			DECLination				diff "				
		hour min sec				deg arcmin arcsec								
Moshier3500	12	22	19,7	----	*cos:	82	11	7,44	----					
Alm105	12	22	20,57	-13,05	-1,77	82	11	4,7	2,74					
alpha Centau	38	Rectascension	diff arcsec			DECLination				diff "				
		hour min sec				deg arcmin arcsec								
	Moshier3500	16	36	31,686	----	*cos:	-65	32	19,09	----				
Alm105	16	36	33,01	-19,86	-8,23	-65	32	22,7	-3,61					
Altair	51	Rectascension	diff arcsec			DECLination				diff "				
		hour min sec				deg arcmin arcsec								
	Moshier3500	21	3	41,741	----	*cos:	14	0	46,72	----				
Alm105	21	3	42,11	-5,54	-5,37	14	0	47,7	-0,98					
Sirius	18	Rectascension	diff arcsec			DECLination				diff "				
		hour min sec				deg arcmin arcsec								
	Moshier3500	7	51	0,309	----	*cos:	-19	58	34,28	----				
Alm105	7	51	0,65	-5,12	-4,81	-19	58	34,5	-0,22					
Vega	49	Rectascension	diff arcsec			DECLination				diff "				
		hour min sec				deg arcmin arcsec								
	Moshier3500	19	27	55,071	----	*cos:	41	8	39,19	----				
Alm105	19	27	55,27	-2,99	-2,25	41	8	37,8	1,39					
Canopus	17	Rectascension	diff arcsec			DECLination				diff "				
		hour min sec				deg arcmin arcsec								
	Moshier3500	6	57	14,506	----	*cos:	-54	9	21,16	----				
Alm105	6	57	14,66	-2,31	-1,35	-54	9	20,7	0,46					

Acruz	30	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier3500		14	10	6,115	----- *cos:	-70	56	3,86	-----
Alm105		14	10	6,61	-7,43 -2,43	-70	56	6,8	-2,94

Miaplacidus	24	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier3500		9	18	45,326	----- *cos:	-76	0	2,51	-----
Alm105		9	18	45,05	4,14 1,00	-76	0	3,8	-1,29

Aldebaran	10	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier3500		6	3	29,787	----- *cos:	17	53	2,01	-----
Alm105		6	3	30,28	-7,40 -7,04	17	53	2	0,01

Betelgeuze	16	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier3500		7	16	28,693	----- *cos:	6	7	13,32	-----
Alm105		7	16	29,13	-6,55 -6,52	6	7	13,6	-0,28

Deneb	53	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier3500		21	33	19,533	----- *cos:	51	20	14,2	-----
Alm105		21	33	19,74	-3,10 -1,94	51	20	15,6	-1,40

Dubhe	27	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier3500		12	24	24,114	----- *cos:	53	27	33,44	-----
Alm105		12	24	24,62	-7,59 -4,52	53	27	30,7	2,74

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2200 =Year date = 1 july, time = 00h00

Delta-T=	00.00				0,01745 =dtr				
Polaris	58	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier		9	21	9,368	----- *cos:	89	16	56,38	-----
Alm105		9	21	10,460	-16,38 -0,21	89	16	56,20	0,18

alpha Centau	38	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier		14	53	38,310	----- *cos:	-61	38	5,98	-----
Alm105		14	53	38,370	-0,90 -0,43	-61	38	6,20	-0,22

Altair	51	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier		20	0	35,173	----- *cos:	9	25	55,99	-----

Alm105	20	0	35,210	-0,55	-0,55	9	25	56,10	-0,11
--------	----	---	--------	--------------	--------------	---	----	-------	--------------

Sirius	18	Rectascension		diff arcsec		DECLination		diff "	
		hour	min	sec		deg	arcm	arcsec	
Moshier		6	53	57,643	----	*cos:	-17	1 28,89	----
Alm105		6	53	57,680	-0,55	-0,53	-17	1 28,90	-0,01

Vega	49	Rectascension		diff arcsec		DECLination		diff "	
		hour	min	sec		deg	arcm	arcsec	
Moshier		18	43	46,126	----	*cos:	38	59 52,05	----
Alm105		18	43	46,150	-0,36	-0,28	38	59 52,00	0,05

Canopus	17	Rectascension		diff arcsec		DECLination		diff "	
		hour	min	sec		deg	arcm	arcsec	
Moshier		6	28	22,646	----	*cos:	-52	49 26,28	----
Alm105		6	28	22,660	-0,21	-0,13	-52	49 26,20	0,08

Acrux	30	Rectascension		diff arcsec		DECLination		diff "	
		hour	min	sec		deg	arcm	arcsec	
Moshier		12	38	9,617	----	*cos:	-64	12 34,75	----
Alm105		12	38	9,650	-0,49	-0,22	-64	12 35,00	-0,25

Miaplacidus	24	Rectascension		diff arcsec		DECLination		diff "	
		hour	min	sec		deg	arcm	arcsec	
Moshier		9	15	10,302	----	*cos:	-70	33 10,75	----
Alm105		9	15	10,300	0,03	0,01	-70	33 10,90	-0,15

Aldebaran	10	Rectascension		diff arcsec		DECLination		diff "	
		hour	min	sec		deg	arcm	arcsec	
Moshier		4	47	27,993	----	*cos:	16	52 12,25	----
Alm105		4	47	28,040	-0,71	-0,67	16	52 12,40	-0,15

Betelgeuze	16	Rectascension		diff arcsec		DECLination		diff "	
		hour	min	sec		deg	arcm	arcsec	
Moshier		6	6	1,532	----	*cos:	7	24 8,50	----
Alm105		6	6	1,570	-0,57	-0,57	7	24 8,60	-0,10

Deneb	53	Rectascension		diff arcsec		DECLination		diff "	
		hour	min	sec		deg	arcm	arcsec	
Moshier		20	48	19,166	----	*cos:	46	0 57,70	----
Alm105		20	48	19,190	-0,36	-0,25	46	0 57,80	-0,10

Dubhe	27	Rectascension		diff arcsec		DECLination		diff "
		hour	min	sec		deg	arcm	arcsec

Moshier	11	15	41,904	----	*cos:	60	39	42,11	----
Alm105	11	15	41,950	-0,69	-0,34	60	39	41,90	0,21

above was:

2200 =YEAR date = 1 july, time = 00h00 #####

NOTE: Polaris is special as the north-star

Stars from Rigil-Kentaurus through Vega are highly mobile, having products of parallax * velocity = at least 10% of Rigil-Kent.

Stars from Canopus through Miaplacidus = southern hemisphere

Stars from Aldebaran through Deubhe = northern hemisphere 0,5253

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ICE51

2045 =YEAR date = 1 JULY, time = 00h00 #####

MOON	58	Rectascension	diff arcsec	DECLination	diff "
		hour min sec		deg arcmin arcsec	
ICE		20 3 50,117	---- *cos:	-22 37 20,16	----
Alm105		20 3 50,130	-0,20 -0,18	-22 37 20,10	0,06

Polaris	58	Rectascension	diff arcsec	DECLination	diff "
		hour min sec		deg arcmin arcsec	
ICE		3 37 42,430	---- *cos:	89 26 19,02	----
Alm105		3 37 42,400	0,45 0,00	89 26 19,00	0,02

Rigil Kentaur	58	Rectascension	diff arcsec	DECLination	diff "
		hour min sec		deg arcmin arcsec	
ICE		14 42 45,444	---- *cos:	-61 1 33,52	----
Alm105		14 42 45,450	-0,09 -0,04	-61 1 33,50	0,02

Altair	58	Rectascension	diff arcsec	DECLination	diff "
		hour min sec		deg arcmin arcsec	
ICE		19 53 1,973	---- *cos:	8 59 27,54	----
Alm105		19 53 1,970	0,05 0,04	8 59 27,50	0,04

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ICE51

1820 =YEAR date = 1 January, time = 00h00 #####

Delta-T= 00.00



Polaris	58	Rectascension	diff arcsec	DECLination	diff "
		hour min sec		deg arcmin arcsec	
ICE51		0 56 47,247	---- *cos:	88 21 16,35	----

Alm105 0 56 47,280 -0,50 -0,01 88 21 16,30 0,05

alpha Centau 38	Rectascension	diff arcsec	DECLination	diff "
	hour min sec		deg arcmin arcsec	
ICE51	14 27 25,185	---- *cos:	-60 4 58,54	----
Alm105	14 27 25,190	-0,08 -0,04	-60 4 58,50	0,04

Altair 51	Rectascension	diff arcsec	DECLination	diff "
	hour min sec		deg arcmin arcsec	
ICE51	19 41 58,456	---- *cos:	8 23 53,13	----
Alm105	19 41 58,460	-0,06 -0,06	8 23 53,10	0,03

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1800 =YEAR date = 1 January, time = 00h00 #####

Delta-T= 00.00

Polaris 58	Rectascension	diff arcsec	DECLination	diff "
	hour min sec		deg arcmin arcsec	
Moshier	0 52 11,590	---- *cos:	88 14 43,63	----
Alm105	0 52 11,570	0,30 0,01	88 14 43,40	0,23

alpha Centau 38	Rectascension	diff arcsec	DECLination	diff "
	hour min sec		deg arcmin arcsec	
Moshier	14 26 5,233	---- *cos:	-59 59 49,14	----
Alm105	14 26 5,190	0,64 0,34	-59 59 48,90	0,24

Altair 51	Rectascension	diff arcsec	DECLination	diff "
	hour min sec		deg arcmin arcsec	
Moshier	19 40 59,477	---- *cos:	8 20 53,40	----
Alm105	19 40 59,440	0,55 0,55	8 20 53,30	0,10

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1700 =YEAR date = 1 January, time = 00h00 #####

Delta-T= 00.00

Polaris 58	Rectascension	diff arcsec	DECLination	diff "
	hour min sec		deg arcmin arcsec	
Moshier	0 35 29,700	---- *cos:	87 41 51,94	----
Alm105	0 35 29,710	-0,15 -0,01	87 41 51,60	0,34

alpha Centau	38	Rectascension	diff arcsec	DEClination	diff "
		hour min sec		deg arcmin arcsec	
Moshier		14 19 33,883	---- *cos:	-59 33 49,18	----
Alm105		14 19 33,820	0,95 0,48	59 33 48,80	0,38

Altair	51	Rectascension	diff arcsec	DEClination	diff "
		hour min sec		deg arcmin arcsec	
Moshier		19 36 6,725	---- *cos:	8 6 35,47	----
Alm105		19 36 6,680	0,67 0,67	8 6 35,40	0,07

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1500 =YEAR date = 1 January, time = 00h00 #####

Delta-T= 00.00

Polaris	58	Rectascension	diff arcsec	DEClination	diff "
		hour min sec		deg arcmin arcsec	
Moshier		0 14 55,046	---- *cos:	86 35 16,14	----
Alm105		0 14 55,100	-0,81 -0,05	86 35 15,60	0,54

alpha Centau	38	Rectascension	diff arcsec	DEClination	diff "
		hour min sec		deg arcmin arcsec	
Moshier		14 6 45,880	---- *cos:	-58 40 38,30	----
Alm105		14 6 45,780	1,50 0,81	-58 40 37,70	0,60

Aldebaran	10	Rectascension	diff arcsec	DEClination	diff "
		hour min sec		deg arcmin arcsec	
Moshier		4 7 23,904	---- *cos:	15 22 35,44	----
Alm105		4 7 23,820	1,26 1,21	15 22 34,90	0,54

Atair	51	Rectascension	diff arcsec	DEClination	diff "
		hour min sec		deg arcmin arcsec	
Moshier		19 26 19,328	---- *cos:	7 39 12,01	----
Alm105		19 26 19,250	1,17 1,16	7 39 12,00	0,01

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1000 =YEAR date = 1 January, time = 00h00 #####

Delta-T= 00.00 =dtr

Polaris	58	Rectascension	diff arcsec	DEClination	diff "
		hour min sec		deg arcmin arcsec	
Moshier		23 48 9,809	---- *cos:	83 47 48,87	----
Alm105		23 48 9,970	-2,42 -0,26	83 47 48,00	0,87

alpha Centau	38	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier		13	36	40,357	----- *cos:	-56	20	5,31	-----
Alm105		13	36	40,160	2,96 1,67	-56	20	3,50	1,81

Altair	51	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier		19	1	50,431	----- *cos:	6	43	1,72	-----
Alm105		19	1	50,310	1,81 1,80	6	43	1,90	-0,18

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500AD =YEAR date = 1 January, time = 00h00 #####

Delta-T=	00.00								
		hour	min	sec		deg	arcm	arcsec	
Polaris	58	23	30	10,632	----- *cos:	81	0	42,31	-----
Alm105		23	30	10,960	-4,92 -0,77	81	0	41,50	0,81

alpha Centau	38	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier		13	8	54,858	----- *cos:	-53	51	3,40	-----
Alm105		13	8	54,540	4,77 2,93	-53	50	59,40	4,00

Altair	51	Rectascension			diff arcsec	DECLination			diff "
		hour	min	sec		deg	arcm	arcsec	
Moshier		18	37	19,427	----- *cos:	6	4	21,77	-----
Alm105		18	37	19,330	1,46 1,45	6	4	22,50	-0,73

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