

Venus_2013
 EPHEMERIS FOR PHYSICAL OBSERVATIONS OF VENUS (0 hr U.T.) - 2013
 (Compiled by: Jeffrey D. Beish, A.L.P.O.)

Date	Elong	R.A.	Dec	Dist	Ls	De	Ds	Phase	Defect	Axis	Size	Mag	CM	CMII
yyyy-mm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	,'	(v)	o	o
2013-Jan-01	21.0W	17:15	-22.3	1.551	352.7	0.1	-0.3	0.937	276.2	5.3	10.8	-3.8	111.1	130.4
2013-Jan-02	20.7W	17:21	-22.5	1.555	354.3	0.1	-0.3	0.938	275.6	4.8	10.8	-3.8	113.8	217.4
2013-Jan-03	20.5W	17:26	-22.6	1.558	355.9	0.1	-0.2	0.940	275.0	4.3	10.8	-3.8	116.6	304.3
2013-Jan-04	20.3W	17:31	-22.7	1.562	357.5	0.2	-0.1	0.941	274.3	3.8	10.8	-3.8	119.3	31.3
2013-Jan-05	20.0W	17:37	-22.8	1.565	359.1	0.2	0.0	0.943	273.7	3.3	10.7	-3.8	122.0	118.3
2013-Jan-06	19.8W	17:42	-22.9	1.569	.7	0.2	0.0	0.944	273.1	2.7	10.7	-3.8	124.8	205.2
2013-Jan-07	19.6W	17:48	-23.0	1.572	2.3	0.2	0.1	0.945	272.4	2.2	10.7	-3.8	127.5	292.2
2013-Jan-08	19.3W	17:53	-23.0	1.576	3.9	0.2	0.2	0.947	271.8	1.7	10.7	-3.8	130.2	19.2
2013-Jan-09	19.1W	17:59	-23.1	1.579	5.5	0.3	0.3	0.948	271.1	1.2	10.7	-3.8	133.0	106.1
2013-Jan-10	18.9W	18:04	-23.1	1.582	7.1	0.3	0.3	0.949	270.5	0.6	10.6	-3.7	135.7	193.1
2013-Jan-11	18.6W	18:09	-23.1	1.586	8.7	0.3	0.4	0.951	269.8	0.1	10.6	-3.7	138.5	280.1
2013-Jan-12	18.4W	18:15	-23.2	1.589	10.3	0.3	0.5	0.952	269.2	359.6	10.6	-3.7	141.2	7.0
2013-Jan-13	18.2W	18:20	-23.2	1.592	11.9	0.3	0.5	0.953	268.5	359.0	10.6	-3.7	143.9	94.0
2013-Jan-14	17.9W	18:26	-23.2	1.595	13.4	0.4	0.6	0.954	267.8	358.5	10.5	-3.7	146.7	181.0
2013-Jan-15	17.7W	18:31	-23.1	1.599	15.0	0.4	0.7	0.956	267.2	358.0	10.5	-3.7	149.4	267.9
2013-Jan-16	17.5W	18:37	-23.1	1.602	16.6	0.4	0.8	0.957	266.5	357.5	10.5	-3.7	152.1	354.9
2013-Jan-17	17.2W	18:42	-23.1	1.605	18.2	0.4	0.8	0.958	265.8	356.9	10.5	-3.7	154.9	81.9
2013-Jan-18	17.0W	18:48	-23.0	1.608	19.8	0.4	0.9	0.959	265.2	356.4	10.5	-3.8	157.6	168.8
2013-Jan-19	16.8W	18:53	-22.9	1.611	21.4	0.4	1.0	0.960	264.5	355.9	10.4	-3.8	160.3	255.8
2013-Jan-20	16.5W	18:59	-22.9	1.614	23.0	0.5	1.0	0.961	263.8	355.4	10.4	-3.8	163.1	342.8
2013-Jan-21	16.3W	19:04	-22.8	1.617	24.6	0.5	1.1	0.963	263.1	354.9	10.4	-3.8	165.8	69.7
2013-Jan-22	16.0W	19:09	-22.7	1.620	26.1	0.5	1.2	0.964	262.5	354.3	10.4	-3.8	168.5	156.7
2013-Jan-23	15.8W	19:15	-22.5	1.622	27.7	0.5	1.2	0.965	261.8	353.8	10.4	-3.8	171.3	243.7
2013-Jan-24	15.6W	19:20	-22.4	1.625	29.3	0.5	1.3	0.966	261.1	353.3	10.3	-3.8	174.0	330.6
2013-Jan-25	15.3W	19:26	-22.3	1.628	30.9	0.5	1.4	0.967	260.5	352.8	10.3	-3.8	176.7	57.6
2013-Jan-26	15.1W	19:31	-22.1	1.631	32.5	0.6	1.4	0.968	259.8	352.3	10.3	-3.8	179.5	144.6
2013-Jan-27	14.9W	19:36	-22.0	1.633	34.1	0.6	1.5	0.969	259.1	351.8	10.3	-3.8	182.2	231.5
2013-Jan-28	14.6W	19:42	-21.8	1.636	35.6	0.6	1.5	0.970	258.5	351.4	10.3	-3.8	185.0	318.5
2013-Jan-29	14.4W	19:47	-21.6	1.639	37.2	0.6	1.6	0.971	257.8	350.9	10.3	-3.8	187.7	45.5
2013-Jan-30	14.2W	19:52	-21.4	1.641	38.8	0.6	1.7	0.972	257.1	350.4	10.2	-3.8	190.4	132.4
2013-Jan-31	13.9W	19:58	-21.2	1.644	40.4	0.6	1.7	0.973	256.5	349.9	10.2	-3.8	193.2	219.4

Date	Elong	R.A.	Dec	Dist	Ls	De	Ds	Phase	Defect	Axis	Size	Mag	CM	CMII
yyyy-mm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	,'	(v)	o	o
2013-Feb-01	13.7W	20:03	-21.0	1.646	42.0	0.6	1.8	0.974	255.8	349.5	10.2	-3.8	195.9	306.4
2013-Feb-02	13.5W	20:08	-20.8	1.649	43.6	0.6	1.8	0.975	255.1	349.0	10.2	-3.8	198.6	33.3
2013-Feb-03	13.2W	20:13	-20.6	1.651	45.1	0.6	1.9	0.975	254.5	348.6	10.2	-3.8	201.4	120.3
2013-Feb-04	13.0W	20:19	-20.3	1.654	46.7	0.7	1.9	0.976	253.8	348.1	10.2	-3.8	204.1	207.3
2013-Feb-05	12.7W	20:24	-20.1	1.656	48.3	0.7	2.0	0.977	253.2	347.7	10.2	-3.8	206.8	294.2
2013-Feb-06	12.5W	20:29	-19.8	1.658	49.9	0.7	2.0	0.978	252.5	347.2	10.1	-3.8	209.6	21.2
2013-Feb-07	12.3W	20:34	-19.5	1.661	51.5	0.7	2.1	0.979	251.9	346.8	10.1	-3.8	212.3	108.2
2013-Feb-08	12.0W	20:40	-19.2	1.663	53.0	0.7	2.1	0.980	251.3	346.4	10.1	-3.8	215.0	195.1
2013-Feb-09	11.8W	20:45	-18.9	1.665	54.6	0.7	2.2	0.980	250.6	346.0	10.1	-3.8	217.8	282.1

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2013-Feb-10	11.6W	20:50	-18.6	1.667	56.2	0.7	2.2	0.981	250.0	345.6	10.1	-3.8	220.5	9.1
2013-Feb-11	11.3W	20:55	-18.3	1.670	57.8	0.7	2.2	0.982	249.3	345.2	10.1	-3.8	223.2	96.0
2013-Feb-12	11.1W	21:00	-18.0	1.672	59.4	0.7	2.3	0.983	248.7	344.8	10.1	-3.8	226.0	183.0
2013-Feb-13	10.9W	21:05	-17.7	1.674	60.9	0.7	2.3	0.983	248.1	344.5	10.0	-3.8	228.7	270.0
2013-Feb-14	10.6W	21:10	-17.3	1.676	62.5	0.7	2.3	0.984	247.5	344.1	10.0	-3.8	231.4	356.9
2013-Feb-15	10.4W	21:15	-17.0	1.678	64.1	0.7	2.4	0.985	246.8	343.7	10.0	-3.8	234.2	83.9
2013-Feb-16	10.1W	21:20	-16.6	1.680	65.7	0.7	2.4	0.986	246.2	343.4	10.0	-3.8	236.9	170.9
2013-Feb-17	9.9W	21:25	-16.3	1.682	67.3	0.7	2.4	0.986	245.6	343.1	10.0	-3.8	239.6	257.8
2013-Feb-18	9.7W	21:30	-15.9	1.683	68.9	0.7	2.5	0.987	244.9	342.7	10.0	-3.8	242.4	344.8
2013-Feb-19	9.4W	21:35	-15.5	1.685	70.4	0.7	2.5	0.987	244.3	342.4	10.0	-3.8	245.1	71.7
2013-Feb-20	9.2W	21:40	-15.2	1.687	72.0	0.7	2.5	0.988	243.7	342.1	10.0	-3.8	247.8	158.7
2013-Feb-21	8.9W	21:45	-14.8	1.689	73.6	0.7	2.5	0.989	243.0	341.8	10.0	-3.8	250.6	245.7
2013-Feb-22	8.7W	21:50	-14.4	1.690	75.2	0.7	2.6	0.989	242.4	341.5	10.0	-3.8	253.3	332.6
2013-Feb-23	8.5W	21:55	-14.0	1.692	76.8	0.7	2.6	0.990	241.8	341.2	9.9	-3.8	256.0	59.6
2013-Feb-24	8.2W	22:00	-13.6	1.694	78.3	0.7	2.6	0.990	241.1	340.9	9.9	-3.8	258.8	146.6
2013-Feb-25	8.0W	22:05	-13.1	1.695	79.9	0.7	2.6	0.991	240.5	340.7	9.9	-3.8	261.5	233.5
2013-Feb-26	7.8W	22:09	-12.7	1.697	81.5	0.7	2.6	0.992	239.8	340.4	9.9	-3.8	264.2	320.5
2013-Feb-27	7.5W	22:14	-12.3	1.698	83.1	0.7	2.6	0.992	239.1	340.2	9.9	-3.8	266.9	47.5
2013-Feb-28	7.3W	22:19	-11.9	1.700	84.7	0.7	2.6	0.993	238.4	339.9	9.9	-3.8	269.7	134.4

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yyyy-mm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	,,	(v)	o	o
2013-Mar-01	7.0W	22:24	-11.4	1.701	86.3	0.7	2.6	0.993	237.8	339.7	9.9	-3.8	272.4	221.4
2013-Mar-02	6.8W	22:28	-11.0	1.703	87.8	0.7	2.6	0.993	237.0	339.5	9.9	-3.8	275.1	308.3
2013-Mar-03	6.6W	22:33	-10.5	1.704	89.4	0.6	2.6	0.994	236.3	339.3	9.9	-3.8	277.9	35.3
2013-Mar-04	6.3W	22:38	-10.1	1.705	91.0	0.6	2.6	0.994	235.6	339.1	9.9	-3.8	280.6	122.3
2013-Mar-05	6.1W	22:43	-9.6	1.707	92.6	0.6	2.6	0.995	234.8	338.9	9.9	-3.8	283.3	209.2
2013-Mar-06	5.9W	22:47	-9.2	1.708	94.2	0.6	2.6	0.995	234.0	338.7	9.8	-3.8	286.1	296.2
2013-Mar-07	5.6W	22:52	-8.7	1.709	95.8	0.6	2.6	0.996	233.1	338.6	9.8	-3.8	288.8	23.2
2013-Mar-08	5.4W	22:57	-8.2	1.710	97.3	0.6	2.6	0.996	232.3	338.4	9.8	-3.8	291.5	110.1
2013-Mar-09	5.1W	23:01	-7.7	1.711	98.9	0.6	2.6	0.996	231.3	338.2	9.8	-3.8	294.2	197.1
2013-Mar-10	4.9W	23:06	-7.3	1.712	100.5	0.6	2.6	0.997	230.3	338.1	9.8	-3.8	297.0	284.0
2013-Mar-11	4.7W	23:11	-6.8	1.713	102.1	0.5	2.6	0.997	229.3	338.0	9.8	-3.8	299.7	11.0
2013-Mar-12	4.4W	23:15	-6.3	1.714	103.7	0.5	2.6	0.997	228.2	337.9	9.8	-3.8	302.4	98.0
2013-Mar-13	4.2W	23:20	-5.8	1.715	105.3	0.5	2.5	0.997	227.0	337.7	9.8	-3.8	305.2	184.9
2013-Mar-14	4.0W	23:25	-5.3	1.716	106.9	0.5	2.5	0.998	225.6	337.6	9.8	-3.8	307.9	271.9
2013-Mar-15	3.7W	23:29	-4.8	1.717	108.4	0.5	2.5	0.998	224.2	337.6	9.8	-3.8	310.6	358.8
2013-Mar-16	3.5W	23:34	-4.3	1.718	110.0	0.5	2.5	0.998	222.6	337.5	9.8	-3.9	313.3	85.8
2013-Mar-17	3.3W	23:38	-3.9	1.718	111.6	0.4	2.5	0.998	220.7	337.4	9.8	-3.9	316.1	172.8
2013-Mar-18	3.1W	23:43	-3.4	1.719	113.2	0.4	2.4	0.999	218.7	337.3	9.8	-3.9	318.8	259.7
2013-Mar-19	2.8W	23:47	-2.9	1.720	114.8	0.4	2.4	0.999	216.4	337.3	9.8	-3.9	321.5	346.7
2013-Mar-20	2.6W	23:52	-2.4	1.720	116.4	0.4	2.4	0.999	213.7	337.2	9.8	-3.9	324.2	73.6
2013-Mar-21	2.4W	23:57	-1.9	1.721	118.0	0.4	2.3	0.999	210.5	337.2	9.8	-3.9	327.0	160.6
2013-Mar-22	2.2W	00:01	-1.4	1.721	119.6	0.3	2.3	0.999	206.8	337.2	9.8	-3.9	329.7	247.6
2013-Mar-23	2.0W	00:06	-0.9	1.722	121.2	0.3	2.3	0.999	202.4	337.2	9.8	-3.9	332.4	334.5
2013-Mar-24	1.8W	00:10	-0.3	1.722	122.7	0.3	2.2	1.000	197.1	337.2	9.8	-3.9	335.2	61.5
2013-Mar-25	1.7W	00:15	0.2	1.723	124.3	0.3	2.2	1.000	190.8	337.2	9.8	-3.9	337.9	148.4
2013-Mar-26	1.5W	00:19	0.7	1.723	125.9	0.3	2.1	1.000	183.2	337.2	9.8	-3.9	340.6	235.4

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2013-Mar-27	1.4W	00:24	1.2	1.723	127.5	0.2	2.1	1.000	174.3	337.2	9.8	-3.9	343.3	322.3
2013-Mar-28	1.4W	00:28	1.7	1.724	129.1	0.2	2.0	1.000	164.2	337.2	9.8	-3.9	346.0	49.3
2013-Mar-29	1.3E	00:33	2.2	1.724	130.7	0.2	2.0	1.000	153.4	337.3	9.8	-3.9	348.8	136.3
2013-Mar-30	1.4E	00:38	2.7	1.724	132.3	0.2	2.0	1.000	142.7	337.3	9.8	-3.9	351.5	223.2
2013-Mar-31	1.4E	00:42	3.2	1.724	133.9	0.1	1.9	1.000	132.6	337.4	9.8	-3.9	354.2	310.2

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yyyy-mmm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	,,	(v)	o	o
2013-Apr-01	1.5E	00:47	3.7	1.724	135.5	0.1	1.8	1.000	123.7	337.5	9.8	-3.9	356.9	37.1
2013-Apr-02	1.7E	00:51	4.2	1.724	137.1	0.1	1.8	1.000	116.1	337.5	9.8	-3.9	359.7	124.1
2013-Apr-03	1.8E	00:56	4.7	1.724	138.7	0.0	1.7	1.000	109.8	337.6	9.8	-3.9	2.4	211.0
2013-Apr-04	2.0E	01:00	5.2	1.724	140.3	0.0	1.7	0.999	104.6	337.7	9.8	-3.9	5.1	298.0
2013-Apr-05	2.2E	01:05	5.7	1.724	141.9	0.0	1.6	0.999	100.3	337.8	9.8	-3.9	7.8	24.9
2013-Apr-06	2.4E	01:09	6.2	1.724	143.5	0.0	1.6	0.999	96.7	338.0	9.8	-3.9	10.5	111.9
2013-Apr-07	2.6E	01:14	6.6	1.723	145.1	-0.1	1.5	0.999	93.7	338.1	9.8	-3.9	13.3	198.8
2013-Apr-08	2.9E	01:19	7.1	1.723	146.6	-0.1	1.5	0.999	91.2	338.2	9.8	-3.9	16.0	285.8
2013-Apr-09	3.1E	01:23	7.6	1.723	148.2	-0.1	1.4	0.999	89.1	338.4	9.8	-3.9	18.7	12.8
2013-Apr-10	3.3E	01:28	8.1	1.722	149.8	-0.2	1.3	0.998	87.3	338.5	9.8	-3.9	21.4	99.7
2013-Apr-11	3.6E	01:32	8.6	1.722	151.4	-0.2	1.3	0.998	85.7	338.7	9.8	-3.9	24.2	186.7
2013-Apr-12	3.8E	01:37	9.1	1.721	153.0	-0.2	1.2	0.998	84.4	338.9	9.8	-3.9	26.9	273.6
2013-Apr-13	4.0E	01:42	9.5	1.721	154.6	-0.2	1.1	0.998	83.2	339.0	9.8	-3.8	29.6	0.6
2013-Apr-14	4.3E	01:46	10.0	1.720	156.2	-0.3	1.1	0.997	82.2	339.2	9.8	-3.8	32.3	87.5
2013-Apr-15	4.5E	01:51	10.5	1.720	157.8	-0.3	1.0	0.997	81.3	339.4	9.8	-3.8	35.0	174.5
2013-Apr-16	4.8E	01:56	10.9	1.719	159.4	-0.3	0.9	0.997	80.6	339.6	9.8	-3.8	37.7	261.4
2013-Apr-17	5.0E	02:00	11.4	1.718	161.0	-0.4	0.9	0.996	79.9	339.9	9.8	-3.8	40.5	348.4
2013-Apr-18	5.3E	02:05	11.8	1.717	162.6	-0.4	0.8	0.996	79.3	340.1	9.8	-3.8	43.2	75.3
2013-Apr-19	5.5E	02:10	12.3	1.716	164.2	-0.4	0.7	0.996	78.8	340.3	9.8	-3.8	45.9	162.3
2013-Apr-20	5.8E	02:15	12.7	1.716	165.8	-0.5	0.6	0.995	78.4	340.6	9.8	-3.8	48.6	249.2
2013-Apr-21	6.0E	02:19	13.2	1.715	167.4	-0.5	0.6	0.995	78.1	340.8	9.8	-3.8	51.3	336.2
2013-Apr-22	6.3E	02:24	13.6	1.714	169.0	-0.5	0.5	0.994	77.7	341.1	9.8	-3.8	54.1	63.1
2013-Apr-23	6.5E	02:29	14.0	1.712	170.6	-0.5	0.4	0.994	77.5	341.4	9.8	-3.8	56.8	150.1
2013-Apr-24	6.8E	02:34	14.4	1.711	172.2	-0.6	0.4	0.993	77.3	341.6	9.8	-3.8	59.5	237.0
2013-Apr-25	7.1E	02:38	14.9	1.710	173.9	-0.6	0.3	0.993	77.1	341.9	9.8	-3.8	62.2	324.0
2013-Apr-26	7.3E	02:43	15.3	1.709	175.5	-0.6	0.2	0.992	77.0	342.2	9.8	-3.8	64.9	50.9
2013-Apr-27	7.6E	02:48	15.7	1.708	177.1	-0.7	0.1	0.992	76.9	342.5	9.8	-3.8	67.6	137.9
2013-Apr-28	7.8E	02:53	16.1	1.706	178.7	-0.7	0.1	0.991	76.8	342.9	9.9	-3.8	70.3	224.8
2013-Apr-29	8.1E	02:58	16.4	1.705	180.3	-0.7	0.0	0.990	76.8	343.2	9.9	-3.8	73.1	311.8
2013-Apr-30	8.3E	03:03	16.8	1.703	181.9	-0.8	-0.1	0.990	76.8	343.5	9.9	-3.8	75.8	38.7

Date	Elong	R.A.	Dec	Dist	Ls	De	Ds	Phase	Defect	Axis	Size	Mag	CM	CMII
yyyy-mmm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	,,	(v)	o	o
2013-May-01	8.6E	03:08	17.2	1.702	183.5	-0.8	-0.2	0.989	76.8	343.9	9.9	-3.8	78.5	125.7
2013-May-02	8.9E	03:13	17.6	1.700	185.1	-0.8	-0.2	0.988	76.8	344.2	9.9	-3.8	81.2	212.6
2013-May-03	9.1E	03:18	17.9	1.699	186.7	-0.8	-0.3	0.988	76.9	344.6	9.9	-3.8	83.9	299.6
2013-May-04	9.4E	03:23	18.3	1.697	188.3	-0.9	-0.4	0.987	77.0	344.9	9.9	-3.8	86.6	26.5
2013-May-05	9.6E	03:28	18.6	1.695	189.9	-0.9	-0.5	0.986	77.1	345.3	9.9	-3.8	89.3	113.5
2013-May-06	9.9E	03:33	19.0	1.694	191.5	-0.9	-0.5	0.985	77.3	345.7	9.9	-3.8	92.1	200.4
2013-May-07	10.2E	03:38	19.3	1.692	193.1	-1.0	-0.6	0.984	77.5	346.1	9.9	-3.8	94.8	287.4

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2013-May-08	10.4E	03:43	19.6	1.690	194.7	-1.0	-0.7	0.984	77.6	346.5	10.0	-3.8	97.5	14.3
2013-May-09	10.7E	03:48	19.9	1.688	196.4	-1.0	-0.7	0.983	77.8	346.9	10.0	-3.8	100.2	101.2
2013-May-10	11.0E	03:53	20.2	1.686	198.0	-1.0	-0.8	0.982	78.1	347.3	10.0	-3.8	102.9	188.2
2013-May-11	11.2E	03:58	20.5	1.684	199.6	-1.1	-0.9	0.981	78.3	347.7	10.0	-3.8	105.6	275.1
2013-May-12	11.5E	04:03	20.8	1.682	201.2	-1.1	-1.0	0.980	78.5	348.2	10.0	-3.8	108.3	2.1
2013-May-13	11.7E	04:08	21.1	1.679	202.8	-1.1	-1.0	0.979	78.8	348.6	10.0	-3.8	111.0	89.0
2013-May-14	12.0E	04:13	21.3	1.677	204.4	-1.2	-1.1	0.978	79.1	349.0	10.0	-3.8	113.8	176.0
2013-May-15	12.3E	04:18	21.6	1.675	206.0	-1.2	-1.2	0.977	79.4	349.5	10.0	-3.8	116.5	262.9
2013-May-16	12.5E	04:24	21.8	1.673	207.6	-1.2	-1.2	0.976	79.7	349.9	10.1	-3.8	119.2	349.9
2013-May-17	12.8E	04:29	22.1	1.670	209.3	-1.2	-1.3	0.975	80.0	350.4	10.1	-3.8	121.9	76.8
2013-May-18	13.1E	04:34	22.3	1.668	210.9	-1.3	-1.4	0.974	80.4	350.9	10.1	-3.8	124.6	163.8
2013-May-19	13.3E	04:39	22.5	1.665	212.5	-1.3	-1.4	0.973	80.7	351.3	10.1	-3.8	127.3	250.7
2013-May-20	13.6E	04:45	22.7	1.663	214.1	-1.3	-1.5	0.972	81.1	351.8	10.1	-3.8	130.0	337.6
2013-May-21	13.9E	04:50	22.9	1.660	215.7	-1.3	-1.5	0.971	81.4	352.3	10.1	-3.8	132.7	64.6
2013-May-22	14.1E	04:55	23.1	1.657	217.3	-1.3	-1.6	0.970	81.8	352.8	10.1	-3.7	135.4	151.5
2013-May-23	14.4E	05:00	23.3	1.654	219.0	-1.4	-1.7	0.968	82.2	353.3	10.2	-3.7	138.1	238.5
2013-May-24	14.7E	05:06	23.4	1.652	220.6	-1.4	-1.7	0.967	82.6	353.8	10.2	-3.7	140.8	325.4
2013-May-25	14.9E	05:11	23.6	1.649	222.2	-1.4	-1.8	0.966	83.0	354.3	10.2	-3.7	143.6	52.3
2013-May-26	15.2E	05:16	23.7	1.646	223.8	-1.4	-1.8	0.965	83.4	354.8	10.2	-3.7	146.3	139.3
2013-May-27	15.5E	05:22	23.8	1.643	225.4	-1.4	-1.9	0.963	83.8	355.3	10.2	-3.7	149.0	226.2
2013-May-28	15.7E	05:27	23.9	1.640	227.1	-1.5	-1.9	0.962	84.3	355.8	10.3	-3.7	151.7	313.2
2013-May-29	16.0E	05:32	24.0	1.637	228.7	-1.5	-2.0	0.961	84.7	356.3	10.3	-3.7	154.4	40.1
2013-May-30	16.3E	05:38	24.1	1.634	230.3	-1.5	-2.0	0.959	85.1	356.8	10.3	-3.7	157.1	127.1
2013-May-31	16.5E	05:43	24.2	1.630	231.9	-1.5	-2.1	0.958	85.6	357.3	10.3	-3.7	159.8	214.0

Date	Elong	R.A.	Dec	Dist	Ls	De	Ds	Phase	Defect	Axis	Size	Mag	CM	CMII
yyyy-mmm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	,	(v)	o	o
2013-Jun-01	16.8E	05:48	24.3	1.627	233.5	-1.5	-2.1	0.957	86.1	357.8	10.3	-3.7	162.5	300.9
2013-Jun-02	17.1E	05:54	24.3	1.624	235.2	-1.5	-2.2	0.955	86.5	358.4	10.4	-3.7	165.2	27.9
2013-Jun-03	17.3E	05:59	24.4	1.620	236.8	-1.6	-2.2	0.954	87.0	358.9	10.4	-3.7	167.9	114.8
2013-Jun-04	17.6E	06:04	24.4	1.617	238.4	-1.6	-2.2	0.952	87.5	359.4	10.4	-3.7	170.6	201.8
2013-Jun-05	17.9E	06:10	24.4	1.613	240.0	-1.6	-2.3	0.951	87.9	359.9	10.4	-3.7	173.3	288.7
2013-Jun-06	18.1E	06:15	24.4	1.610	241.7	-1.6	-2.3	0.949	88.4	0.4	10.4	-3.7	176.0	15.6
2013-Jun-07	18.4E	06:21	24.4	1.606	243.3	-1.6	-2.4	0.948	88.9	1.0	10.5	-3.7	178.7	102.6
2013-Jun-08	18.7E	06:26	24.4	1.603	244.9	-1.6	-2.4	0.946	89.4	1.5	10.5	-3.7	181.4	189.5
2013-Jun-09	18.9E	06:31	24.4	1.599	246.5	-1.6	-2.4	0.944	89.9	2.0	10.5	-3.7	184.1	276.4
2013-Jun-10	19.2E	06:37	24.3	1.595	248.2	-1.6	-2.4	0.943	90.3	2.5	10.5	-3.7	186.8	3.4
2013-Jun-11	19.5E	06:42	24.3	1.591	249.8	-1.6	-2.5	0.941	90.8	3.0	10.6	-3.7	189.5	90.3
2013-Jun-12	19.7E	06:47	24.2	1.587	251.4	-1.6	-2.5	0.939	91.3	3.6	10.6	-3.7	192.2	177.3
2013-Jun-13	20.0E	06:53	24.1	1.583	253.0	-1.6	-2.5	0.938	91.8	4.1	10.6	-3.7	194.9	264.2
2013-Jun-14	20.2E	06:58	24.0	1.579	254.6	-1.6	-2.5	0.936	92.3	4.6	10.6	-3.7	197.6	351.1
2013-Jun-15	20.5E	07:03	23.9	1.575	256.3	-1.6	-2.6	0.934	92.8	5.1	10.7	-3.7	200.3	78.1
2013-Jun-16	20.8E	07:09	23.8	1.571	257.9	-1.6	-2.6	0.933	93.3	5.6	10.7	-3.7	203.0	165.0
2013-Jun-17	21.0E	07:14	23.7	1.567	259.5	-1.6	-2.6	0.931	93.8	6.1	10.7	-3.7	205.7	251.9
2013-Jun-18	21.3E	07:19	23.6	1.563	261.2	-1.6	-2.6	0.929	94.2	6.6	10.8	-3.7	208.4	338.9
2013-Jun-19	21.6E	07:24	23.4	1.559	262.8	-1.6	-2.6	0.927	94.7	7.1	10.8	-3.7	211.1	65.8
2013-Jun-20	21.8E	07:30	23.3	1.554	264.4	-1.6	-2.6	0.925	95.2	7.6	10.8	-3.7	213.8	152.7
2013-Jun-21	22.1E	07:35	23.1	1.550	266.0	-1.6	-2.6	0.923	95.7	8.0	10.9	-3.7	216.5	239.7

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2013-Jun-22	22.4E	07:40	22.9	1.546	267.7	-1.6	-2.6	0.921	96.2	8.5	10.9	-3.7	219.2	326.6
2013-Jun-23	22.6E	07:45	22.7	1.541	269.3	-1.6	-2.6	0.920	96.6	9.0	10.9	-3.7	221.9	53.5
2013-Jun-24	22.9E	07:51	22.5	1.537	270.9	-1.6	-2.6	0.918	97.1	9.4	10.9	-3.7	224.6	140.5
2013-Jun-25	23.1E	07:56	22.3	1.532	272.5	-1.6	-2.6	0.916	97.6	9.9	11.0	-3.7	227.3	227.4
2013-Jun-26	23.4E	08:01	22.1	1.527	274.2	-1.6	-2.6	0.914	98.0	10.4	11.0	-3.7	230.0	314.3
2013-Jun-27	23.7E	08:06	21.9	1.523	275.8	-1.6	-2.6	0.912	98.5	10.8	11.0	-3.7	232.7	41.3
2013-Jun-28	23.9E	08:11	21.6	1.518	277.4	-1.6	-2.6	0.910	98.9	11.2	11.1	-3.7	235.4	128.2
2013-Jun-29	24.2E	08:16	21.4	1.513	279.0	-1.6	-2.6	0.908	99.4	11.7	11.1	-3.7	238.1	215.1
2013-Jun-30	24.5E	08:21	21.1	1.508	280.7	-1.5	-2.6	0.905	99.8	12.1	11.2	-3.7	240.8	302.1

Date	Elong	R.A.	Dec	Dist	Ls	De	Ds	Phase	Defect	Axis	Size	Mag	CM	CMII
yyyy-mmm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	'	(v)	o	o
2013-Jul-01	24.7E	08:26	20.8	1.504	282.3	-1.5	-2.6	0.903	100.3	12.5	11.2	-3.7	243.5	29.0
2013-Jul-02	25.0E	08:31	20.5	1.499	283.9	-1.5	-2.6	0.901	100.7	12.9	11.2	-3.7	246.2	115.9
2013-Jul-03	25.2E	08:36	20.2	1.494	285.5	-1.5	-2.5	0.899	101.1	13.3	11.3	-3.7	248.9	202.8
2013-Jul-04	25.5E	08:41	19.9	1.489	287.1	-1.5	-2.5	0.897	101.5	13.7	11.3	-3.7	251.6	289.8
2013-Jul-05	25.7E	08:46	19.6	1.484	288.8	-1.5	-2.5	0.895	101.9	14.1	11.3	-3.7	254.3	16.7
2013-Jul-06	26.0E	08:51	19.3	1.478	290.4	-1.4	-2.5	0.892	102.4	14.5	11.4	-3.7	257.0	103.6
2013-Jul-07	26.3E	08:56	19.0	1.473	292.0	-1.4	-2.4	0.890	102.8	14.9	11.4	-3.7	259.7	190.6
2013-Jul-08	26.5E	09:01	18.6	1.468	293.6	-1.4	-2.4	0.888	103.1	15.3	11.5	-3.7	262.3	277.5
2013-Jul-09	26.8E	09:06	18.3	1.463	295.3	-1.4	-2.4	0.886	103.5	15.6	11.5	-3.7	265.0	4.4
2013-Jul-10	27.0E	09:11	18.0	1.458	296.9	-1.3	-2.4	0.883	103.9	16.0	11.5	-3.7	267.7	91.3
2013-Jul-11	27.3E	09:16	17.6	1.452	298.5	-1.3	-2.3	0.881	104.3	16.3	11.6	-3.7	270.4	178.3
2013-Jul-12	27.5E	09:21	17.2	1.447	300.1	-1.3	-2.3	0.879	104.6	16.6	11.6	-3.7	273.1	265.2
2013-Jul-13	27.8E	09:25	16.8	1.441	301.7	-1.3	-2.2	0.876	105.0	17.0	11.7	-3.7	275.8	352.1
2013-Jul-14	28.0E	09:30	16.5	1.436	303.4	-1.2	-2.2	0.874	105.4	17.3	11.7	-3.7	278.5	79.0
2013-Jul-15	28.3E	09:35	16.1	1.430	305.0	-1.2	-2.2	0.872	105.7	17.6	11.8	-3.7	281.2	166.0
2013-Jul-16	28.5E	09:40	15.7	1.425	306.6	-1.2	-2.1	0.869	106.0	17.9	11.8	-3.8	283.9	252.9
2013-Jul-17	28.8E	09:44	15.3	1.419	308.2	-1.1	-2.1	0.867	106.4	18.2	11.9	-3.8	286.5	339.8
2013-Jul-18	29.0E	09:49	14.9	1.414	309.8	-1.1	-2.0	0.864	106.7	18.5	11.9	-3.8	289.2	66.7
2013-Jul-19	29.3E	09:54	14.4	1.408	311.4	-1.1	-2.0	0.862	107.0	18.7	11.9	-3.8	291.9	153.6
2013-Jul-20	29.5E	09:58	14.0	1.402	313.1	-1.0	-1.9	0.859	107.3	19.0	12.0	-3.8	294.6	240.6
2013-Jul-21	29.8E	10:03	13.6	1.396	314.7	-1.0	-1.9	0.857	107.6	19.2	12.0	-3.8	297.3	327.5
2013-Jul-22	30.0E	10:08	13.2	1.391	316.3	-1.0	-1.8	0.854	107.9	19.5	12.1	-3.8	300.0	54.4
2013-Jul-23	30.3E	10:12	12.7	1.385	317.9	-0.9	-1.8	0.852	108.2	19.7	12.1	-3.8	302.7	141.3
2013-Jul-24	30.5E	10:17	12.3	1.379	319.5	-0.9	-1.7	0.849	108.4	20.0	12.2	-3.8	305.3	228.2
2013-Jul-25	30.8E	10:21	11.8	1.373	321.1	-0.8	-1.7	0.847	108.7	20.2	12.3	-3.8	308.0	315.2
2013-Jul-26	31.0E	10:26	11.4	1.367	322.7	-0.8	-1.6	0.844	108.9	20.4	12.3	-3.8	310.7	42.1
2013-Jul-27	31.3E	10:30	10.9	1.361	324.4	-0.8	-1.5	0.842	109.2	20.6	12.4	-3.8	313.4	129.0
2013-Jul-28	31.5E	10:35	10.4	1.355	326.0	-0.7	-1.5	0.839	109.4	20.8	12.4	-3.8	316.1	215.9
2013-Jul-29	31.7E	10:39	10.0	1.349	327.6	-0.7	-1.4	0.836	109.7	21.0	12.5	-3.8	318.7	302.8
2013-Jul-30	32.0E	10:44	9.5	1.343	329.2	-0.6	-1.4	0.834	109.9	21.1	12.5	-3.8	321.4	29.7
2013-Jul-31	32.2E	10:48	9.0	1.337	330.8	-0.6	-1.3	0.831	110.1	21.3	12.6	-3.8	324.1	116.6

Date	Elong	R.A.	Dec	Dist	Ls	De	Ds	Phase	Defect	Axis	Size	Mag	CM	CMII
yyyy-mmm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	'	(v)	o	o
2013-Aug-01	32.5E	10:53	8.5	1.331	332.4	-0.5	-1.2	0.828	110.3	21.5	12.6	-3.8	326.8	203.6
2013-Aug-02	32.7E	10:57	8.1	1.324	334.0	-0.5	-1.2	0.826	110.5	21.6	12.7	-3.8	329.4	290.5

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2013-Aug-03	32.9E	11:02	7.6	1.318	335.6	-0.4	-1.1	0.823	110.7	21.8	12.8	-3.8	332.1	17.4
2013-Aug-04	33.2E	11:06	7.1	1.312	337.2	-0.4	-1.0	0.820	110.9	21.9	12.8	-3.8	334.8	104.3
2013-Aug-05	33.4E	11:10	6.6	1.306	338.8	-0.3	-1.0	0.817	111.0	22.0	12.9	-3.8	337.5	191.2
2013-Aug-06	33.6E	11:15	6.1	1.299	340.4	-0.3	-0.9	0.815	111.2	22.1	12.9	-3.8	340.1	278.1
2013-Aug-07	33.9E	11:19	5.6	1.293	342.0	-0.2	-0.8	0.812	111.4	22.2	13.0	-3.8	342.8	5.0
2013-Aug-08	34.1E	11:23	5.1	1.286	343.6	-0.2	-0.7	0.809	111.5	22.3	13.1	-3.8	345.5	91.9
2013-Aug-09	34.3E	11:28	4.6	1.280	345.2	-0.1	-0.7	0.806	111.6	22.4	13.1	-3.8	348.2	178.8
2013-Aug-10	34.6E	11:32	4.1	1.274	346.8	-0.1	-0.6	0.803	111.8	22.5	13.2	-3.8	350.8	265.7
2013-Aug-11	34.8E	11:36	3.6	1.267	348.4	0.0	-0.5	0.800	111.9	22.6	13.3	-3.8	353.5	352.7
2013-Aug-12	35.0E	11:41	3.1	1.260	350.0	0.1	-0.5	0.798	112.0	22.6	13.3	-3.8	356.2	79.6
2013-Aug-13	35.3E	11:45	2.5	1.254	351.6	0.1	-0.4	0.795	112.1	22.7	13.4	-3.8	358.8	166.5
2013-Aug-14	35.5E	11:49	2.0	1.247	353.2	0.2	-0.3	0.792	112.2	22.7	13.5	-3.8	1.5	253.4
2013-Aug-15	35.7E	11:54	1.5	1.241	354.8	0.2	-0.2	0.789	112.3	22.8	13.6	-3.8	4.2	340.3
2013-Aug-16	35.9E	11:58	1.0	1.234	356.4	0.3	-0.2	0.786	112.4	22.8	13.6	-3.8	6.8	67.2
2013-Aug-17	36.2E	12:02	0.5	1.227	358.0	0.4	-0.1	0.783	112.5	22.8	13.7	-3.8	9.5	154.1
2013-Aug-18	36.4E	12:06	0.0	1.221	359.6	0.4	0.0	0.780	112.5	22.8	13.8	-3.9	12.2	241.0
2013-Aug-19	36.6E	12:11	-0.5	1.214	1.2	0.5	0.1	0.777	112.6	22.8	13.9	-3.9	14.8	327.9
2013-Aug-20	36.8E	12:15	-1.1	1.207	2.8	0.5	0.1	0.774	112.6	22.8	13.9	-3.9	17.5	54.8
2013-Aug-21	37.0E	12:19	-1.6	1.200	4.4	0.6	0.2	0.771	112.7	22.8	14.0	-3.9	20.2	141.7
2013-Aug-22	37.3E	12:23	-2.1	1.194	6.0	0.7	0.3	0.768	112.7	22.8	14.1	-3.9	22.8	228.6
2013-Aug-23	37.5E	12:28	-2.6	1.187	7.6	0.7	0.3	0.765	112.7	22.8	14.2	-3.9	25.5	315.5
2013-Aug-24	37.7E	12:32	-3.1	1.180	9.2	0.8	0.4	0.762	112.7	22.7	14.3	-3.9	28.1	42.4
2013-Aug-25	37.9E	12:36	-3.6	1.173	10.7	0.9	0.5	0.759	112.7	22.7	14.3	-3.9	30.8	129.3
2013-Aug-26	38.1E	12:40	-4.1	1.166	12.3	0.9	0.6	0.756	112.7	22.6	14.4	-3.9	33.5	216.1
2013-Aug-27	38.3E	12:45	-4.7	1.159	13.9	1.0	0.6	0.753	112.7	22.6	14.5	-3.9	36.1	303.0
2013-Aug-28	38.5E	12:49	-5.2	1.152	15.5	1.1	0.7	0.749	112.7	22.5	14.6	-3.9	38.8	29.9
2013-Aug-29	38.7E	12:53	-5.7	1.145	17.1	1.1	0.8	0.746	112.7	22.4	14.7	-3.9	41.4	116.8
2013-Aug-30	38.9E	12:57	-6.2	1.138	18.7	1.2	0.8	0.743	112.6	22.3	14.8	-3.9	44.1	203.7
2013-Aug-31	39.1E	13:02	-6.7	1.131	20.3	1.3	0.9	0.740	112.6	22.2	14.9	-3.9	46.7	290.6

Date	Elong	R.A.	Dec	Dist	Ls	De	Ds	Phase	Defect	Axis	Size	Mag	CM	CMII
yyyy-mm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	'	(v)	o	o
2013-Sep-01	39.3E	13:06	-7.2	1.124	21.9	1.3	1.0	0.737	112.5	22.1	15.0	-3.9	49.4	17.5
2013-Sep-02	39.5E	13:10	-7.7	1.117	23.4	1.4	1.0	0.733	112.5	22.0	15.1	-3.9	52.0	104.4
2013-Sep-03	39.7E	13:15	-8.2	1.110	25.0	1.5	1.1	0.730	112.4	21.9	15.1	-3.9	54.7	191.3
2013-Sep-04	39.9E	13:19	-8.7	1.103	26.6	1.5	1.2	0.727	112.3	21.8	15.2	-3.9	57.3	278.1
2013-Sep-05	40.1E	13:23	-9.2	1.096	28.2	1.6	1.2	0.724	112.2	21.7	15.3	-3.9	60.0	5.0
2013-Sep-06	40.3E	13:27	-9.7	1.089	29.8	1.7	1.3	0.720	112.2	21.5	15.4	-4.0	62.6	91.9
2013-Sep-07	40.5E	13:32	-10.2	1.082	31.4	1.7	1.4	0.717	112.1	21.4	15.5	-4.0	65.3	178.8
2013-Sep-08	40.7E	13:36	-10.6	1.075	33.0	1.8	1.4	0.714	111.9	21.2	15.7	-4.0	67.9	265.7
2013-Sep-09	40.9E	13:40	-11.1	1.067	34.5	1.9	1.5	0.711	111.8	21.0	15.8	-4.0	70.6	352.5
2013-Sep-10	41.1E	13:45	-11.6	1.060	36.1	1.9	1.6	0.707	111.7	20.9	15.9	-4.0	73.2	79.4
2013-Sep-11	41.3E	13:49	-12.1	1.053	37.7	2.0	1.6	0.704	111.6	20.7	16.0	-4.0	75.8	166.3
2013-Sep-12	41.5E	13:53	-12.5	1.046	39.3	2.1	1.7	0.700	111.4	20.5	16.1	-4.0	78.5	253.2
2013-Sep-13	41.6E	13:58	-13.0	1.039	40.9	2.1	1.7	0.697	111.3	20.3	16.2	-4.0	81.1	340.0
2013-Sep-14	41.8E	14:02	-13.5	1.031	42.4	2.2	1.8	0.694	111.1	20.1	16.3	-4.0	83.7	66.9
2013-Sep-15	42.0E	14:06	-13.9	1.024	44.0	2.3	1.8	0.690	110.9	19.9	16.4	-4.0	86.4	153.8
2013-Sep-16	42.2E	14:11	-14.4	1.017	45.6	2.3	1.9	0.687	110.7	19.6	16.5	-4.0	89.0	240.7

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2013-Sep-17	42.4E	14:15	-14.8	1.009	47.2	2.4	1.9	0.683	110.6	19.4	16.7	-4.0	91.6	327.5
2013-Sep-18	42.5E	14:19	-15.3	1.002	48.8	2.5	2.0	0.680	110.4	19.2	16.8	-4.0	94.3	54.4
2013-Sep-19	42.7E	14:24	-15.7	0.995	50.4	2.5	2.0	0.676	110.2	18.9	16.9	-4.0	96.9	141.3
2013-Sep-20	42.9E	14:28	-16.1	0.987	51.9	2.6	2.1	0.673	110.0	18.7	17.0	-4.1	99.5	228.1
2013-Sep-21	43.0E	14:33	-16.5	0.980	53.5	2.7	2.1	0.669	109.7	18.4	17.2	-4.1	102.1	315.0
2013-Sep-22	43.2E	14:37	-17.0	0.973	55.1	2.7	2.2	0.665	109.5	18.2	17.3	-4.1	104.8	41.8
2013-Sep-23	43.4E	14:42	-17.4	0.965	56.7	2.8	2.2	0.662	109.3	17.9	17.4	-4.1	107.4	128.7
2013-Sep-24	43.5E	14:46	-17.8	0.958	58.3	2.8	2.2	0.658	109.0	17.6	17.6	-4.1	110.0	215.5
2013-Sep-25	43.7E	14:51	-18.2	0.950	59.8	2.9	2.3	0.654	108.8	17.3	17.7	-4.1	112.6	302.4
2013-Sep-26	43.8E	14:55	-18.6	0.943	61.4	3.0	2.3	0.651	108.5	17.0	17.8	-4.1	115.2	29.3
2013-Sep-27	44.0E	14:59	-19.0	0.935	63.0	3.0	2.4	0.647	108.3	16.7	18.0	-4.1	117.8	116.1
2013-Sep-28	44.1E	15:04	-19.3	0.928	64.6	3.1	2.4	0.643	108.0	16.4	18.1	-4.1	120.5	202.9
2013-Sep-29	44.3E	15:09	-19.7	0.920	66.2	3.1	2.4	0.639	107.7	16.1	18.3	-4.1	123.1	289.8
2013-Sep-30	44.4E	15:13	-20.1	0.913	67.7	3.2	2.4	0.636	107.4	15.8	18.4	-4.1	125.7	16.6

Date	Elong	R.A.	Dec	Dist	Ls	De	Ds	Phase	Defect	Axis	Size	Mag	CM	CMII
yyyy-mmm-dd	o	hh:mm	o	A.U.	o	o	o	k	o	o	,,	(v)	o	o
2013-Oct-01	44.6E	15:18	-20.4	0.905	69.3	3.3	2.5	0.632	107.1	15.4	18.6	-4.1	128.3	103.5
2013-Oct-02	44.7E	15:22	-20.8	0.898	70.9	3.3	2.5	0.628	106.8	15.1	18.7	-4.1	130.9	190.3
2013-Oct-03	44.8E	15:27	-21.1	0.890	72.5	3.4	2.5	0.624	106.5	14.8	18.9	-4.2	133.5	277.2
2013-Oct-04	45.0E	15:31	-21.5	0.883	74.1	3.4	2.5	0.620	106.2	14.4	19.1	-4.2	136.1	4.0
2013-Oct-05	45.1E	15:36	-21.8	0.875	75.7	3.5	2.6	0.616	105.9	14.1	19.2	-4.2	138.7	90.8
2013-Oct-06	45.2E	15:40	-22.1	0.868	77.2	3.5	2.6	0.612	105.5	13.7	19.4	-4.2	141.3	177.6
2013-Oct-07	45.3E	15:45	-22.4	0.860	78.8	3.6	2.6	0.608	105.2	13.3	19.6	-4.2	143.9	264.5
2013-Oct-08	45.5E	15:50	-22.7	0.853	80.4	3.6	2.6	0.604	104.9	13.0	19.7	-4.2	146.4	351.3
2013-Oct-09	45.6E	15:54	-23.0	0.845	82.0	3.7	2.6	0.600	104.5	12.6	19.9	-4.2	149.0	78.1
2013-Oct-10	45.7E	15:59	-23.3	0.838	83.6	3.7	2.6	0.596	104.1	12.2	20.1	-4.2	151.6	164.9
2013-Oct-11	45.8E	16:04	-23.5	0.830	85.1	3.8	2.6	0.592	103.8	11.8	20.3	-4.2	154.2	251.8
2013-Oct-12	45.9E	16:08	-23.8	0.822	86.7	3.8	2.6	0.588	103.4	11.4	20.5	-4.2	156.8	338.6
2013-Oct-13	46.0E	16:13	-24.1	0.815	88.3	3.8	2.6	0.584	103.0	11.0	20.6	-4.3	159.3	65.4
2013-Oct-14	46.1E	16:17	-24.3	0.807	89.9	3.9	2.6	0.579	102.7	10.6	20.8	-4.3	161.9	152.2
2013-Oct-15	46.2E	16:22	-24.5	0.800	91.5	3.9	2.6	0.575	102.3	10.2	21.0	-4.3	164.5	239.0
2013-Oct-16	46.3E	16:27	-24.8	0.792	93.1	4.0	2.6	0.571	101.9	9.8	21.2	-4.3	167.0	325.8
2013-Oct-17	46.4E	16:31	-25.0	0.784	94.7	4.0	2.6	0.566	101.5	9.4	21.4	-4.3	169.6	52.6
2013-Oct-18	46.5E	16:36	-25.2	0.777	96.2	4.0	2.6	0.562	101.1	9.0	21.7	-4.3	172.2	139.4
2013-Oct-19	46.5E	16:41	-25.4	0.769	97.8	4.1	2.6	0.558	100.7	8.6	21.9	-4.3	174.7	226.2
2013-Oct-20	46.6E	16:45	-25.6	0.761	99.4	4.1	2.6	0.553	100.3	8.1	22.1	-4.3	177.2	312.9
2013-Oct-21	46.7E	16:50	-25.7	0.754	101.0	4.1	2.6	0.549	99.9	7.7	22.3	-4.3	179.8	39.7
2013-Oct-22	46.7E	16:55	-25.9	0.746	102.6	4.2	2.6	0.544	99.5	7.3	22.5	-4.3	182.3	126.5
2013-Oct-23	46.8E	16:59	-26.1	0.738	104.2	4.2	2.6	0.539	99.1	6.8	22.8	-4.4	184.9	213.3
2013-Oct-24	46.9E	17:04	-26.2	0.731	105.7	4.2	2.5	0.535	98.7	6.4	23.0	-4.4	187.4	300.0
2013-Oct-25	46.9E	17:08	-26.3	0.723	107.3	4.2	2.5	0.530	98.3	6.0	23.3	-4.4	189.9	26.8
2013-Oct-26	46.9E	17:13	-26.5	0.716	108.9	4.3	2.5	0.525	97.8	5.5	23.5	-4.4	192.4	113.6
2013-Oct-27	47.0E	17:18	-26.6	0.708	110.5	4.3	2.5	0.520	97.4	5.1	23.8	-4.4	195.0	200.3
2013-Oct-28	47.0E	17:22	-26.7	0.700	112.1	4.3	2.4	0.516	97.0	4.7	24.0	-4.4	197.5	287.1
2013-Oct-29	47.0E	17:27	-26.8	0.693	113.7	4.3	2.4	0.511	96.6	4.2	24.3	-4.4	200.0	13.8
2013-Oct-30	47.1E	17:31	-26.9	0.685	115.3	4.3	2.4	0.506	96.2	3.8	24.6	-4.4	202.5	100.5
2013-Oct-31	47.1E	17:36	-26.9	0.677	116.9	4.3	2.4	0.501	95.7	3.4	24.8	-4.4	205.0	187.3

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Date yyyy-mm-dd	Elong o	R.A. hh:mm	Dec o	Dist A.U.	Ls o	De o	Ds o	Phase k	Defect o	Axis o	Size ,,	Mag (v)	CM o	CMII o
2013-Nov-01	47.1E	17:40	-27.0	0.670	118.5	4.3	2.3	0.496	95.3	2.9	25.1	-4.5	207.4	274.0
2013-Nov-02	47.1E	17:45	-27.1	0.662	120.0	4.3	2.3	0.490	94.9	2.5	25.4	-4.5	209.9	0.7
2013-Nov-03	47.1E	17:49	-27.1	0.654	121.6	4.3	2.2	0.485	94.5	2.1	25.7	-4.5	212.4	87.4
2013-Nov-04	47.0E	17:54	-27.1	0.647	123.2	4.3	2.2	0.480	94.0	1.7	26.0	-4.5	214.9	174.1
2013-Nov-05	47.0E	17:58	-27.1	0.639	124.8	4.3	2.2	0.475	93.6	1.2	26.3	-4.5	217.3	260.8
2013-Nov-06	47.0E	18:02	-27.2	0.632	126.4	4.3	2.1	0.469	93.2	0.8	26.6	-4.5	219.8	347.5
2013-Nov-07	47.0E	18:07	-27.2	0.624	128.0	4.3	2.1	0.464	92.8	0.4	27.0	-4.5	222.2	74.2
2013-Nov-08	46.9E	18:11	-27.2	0.616	129.6	4.3	2.0	0.458	92.4	360.0	27.3	-4.5	224.7	160.9
2013-Nov-09	46.9E	18:15	-27.1	0.609	131.2	4.3	2.0	0.453	92.0	359.5	27.6	-4.5	227.1	247.5
2013-Nov-10	46.8E	18:19	-27.1	0.601	132.8	4.3	1.9	0.447	91.6	359.1	28.0	-4.6	229.5	334.2
2013-Nov-11	46.7E	18:24	-27.1	0.594	134.4	4.3	1.9	0.441	91.1	358.7	28.3	-4.6	231.9	60.8
2013-Nov-12	46.6E	18:28	-27.0	0.586	136.0	4.2	1.8	0.436	90.7	358.3	28.7	-4.6	234.3	147.5
2013-Nov-13	46.5E	18:32	-27.0	0.579	137.6	4.2	1.8	0.430	90.3	357.9	29.1	-4.6	236.7	234.1
2013-Nov-14	46.4E	18:36	-26.9	0.571	139.1	4.2	1.7	0.424	89.9	357.5	29.5	-4.6	239.1	320.7
2013-Nov-15	46.3E	18:40	-26.8	0.564	140.7	4.2	1.7	0.418	89.6	357.2	29.8	-4.6	241.5	47.3
2013-Nov-16	46.2E	18:44	-26.8	0.556	142.3	4.1	1.6	0.411	89.2	356.8	30.2	-4.6	243.8	133.9
2013-Nov-17	46.0E	18:48	-26.7	0.549	143.9	4.1	1.6	0.405	88.8	356.4	30.7	-4.6	246.2	220.5
2013-Nov-18	45.9E	18:51	-26.6	0.541	145.5	4.0	1.5	0.399	88.4	356.0	31.1	-4.6	248.5	307.1
2013-Nov-19	45.7E	18:55	-26.5	0.534	147.1	4.0	1.4	0.392	88.0	355.7	31.5	-4.7	250.9	33.7
2013-Nov-20	45.6E	18:59	-26.3	0.526	148.7	4.0	1.4	0.386	87.7	355.3	32.0	-4.7	253.2	120.2
2013-Nov-21	45.4E	19:02	-26.2	0.519	150.3	3.9	1.3	0.379	87.3	355.0	32.4	-4.7	255.5	206.7
2013-Nov-22	45.2E	19:06	-26.1	0.512	151.9	3.8	1.2	0.372	87.0	354.7	32.9	-4.7	257.8	293.3
2013-Nov-23	44.9E	19:09	-26.0	0.504	153.5	3.8	1.2	0.366	86.6	354.3	33.3	-4.7	260.0	19.8
2013-Nov-24	44.7E	19:13	-25.8	0.497	155.1	3.7	1.1	0.359	86.3	354.0	33.8	-4.7	262.3	106.3
2013-Nov-25	44.5E	19:16	-25.7	0.490	156.7	3.6	1.0	0.352	85.9	353.7	34.3	-4.7	264.5	192.7
2013-Nov-26	44.2E	19:19	-25.5	0.483	158.3	3.6	1.0	0.345	85.6	353.4	34.8	-4.7	266.8	279.2
2013-Nov-27	43.9E	19:22	-25.4	0.476	159.9	3.5	0.9	0.337	85.3	353.1	35.4	-4.7	269.0	5.7
2013-Nov-28	43.6E	19:26	-25.2	0.468	161.5	3.4	0.8	0.330	84.9	352.8	35.9	-4.7	271.2	92.1
2013-Nov-29	43.3E	19:29	-25.0	0.461	163.1	3.3	0.8	0.322	84.6	352.5	36.5	-4.7	273.3	178.5
2013-Nov-30	42.9E	19:31	-24.8	0.454	164.7	3.2	0.7	0.315	84.3	352.3	37.0	-4.7	275.5	264.9

Date yyyy-mm-dd	Elong o	R.A. hh:mm	Dec o	Dist A.U.	Ls o	De o	Ds o	Phase k	Defect o	Axis o	Size ,,	Mag (v)	CM o	CMII o
2013-Dec-01	42.6E	19:34	-24.6	0.447	166.3	3.1	0.6	0.307	84.0	352.0	37.6	-4.8	277.6	351.3
2013-Dec-02	42.2E	19:37	-24.5	0.440	167.9	3.0	0.6	0.299	83.7	351.8	38.2	-4.8	279.7	77.6
2013-Dec-03	41.8E	19:40	-24.3	0.434	169.5	2.9	0.5	0.291	83.4	351.5	38.8	-4.8	281.8	163.9
2013-Dec-04	41.4E	19:42	-24.1	0.427	171.1	2.8	0.4	0.283	83.1	351.3	39.4	-4.8	283.9	250.2
2013-Dec-05	40.9E	19:44	-23.9	0.420	172.7	2.7	0.3	0.275	82.8	351.1	40.1	-4.8	286.0	336.5
2013-Dec-06	40.4E	19:47	-23.7	0.413	174.3	2.6	0.3	0.267	82.6	350.9	40.7	-4.8	288.0	62.8
2013-Dec-07	39.9E	19:49	-23.5	0.407	175.9	2.5	0.2	0.259	82.3	350.7	41.4	-4.8	290.0	149.0
2013-Dec-08	39.4E	19:51	-23.2	0.400	177.5	2.3	0.1	0.250	82.0	350.5	42.0	-4.8	292.0	235.2
2013-Dec-09	38.9E	19:53	-23.0	0.394	179.1	2.2	0.0	0.241	81.7	350.4	42.7	-4.8	293.9	321.4
2013-Dec-10	38.3E	19:54	-22.8	0.387	180.8	2.1	0.0	0.233	81.5	350.2	43.4	-4.8	295.8	47.6
2013-Dec-11	37.7E	19:56	-22.6	0.381	182.4	1.9	-0.1	0.224	81.2	350.1	44.2	-4.8	297.7	133.7
2013-Dec-12	37.0E	19:58	-22.4	0.375	184.0	1.8	-0.2	0.215	80.9	349.9	44.9	-4.8	299.6	219.8

Venus_2013														
2013-Dec-13	36.3E	19:59	-22.2	0.369	185.6	1.6	-0.3	0.206	80.7	349.8	45.6	-4.8	301.4	305.9
2013-Dec-14	35.6E	20:00	-21.9	0.362	187.2	1.4	-0.3	0.197	80.4	349.7	46.4	-4.8	303.2	31.9
2013-Dec-15	34.9E	20:01	-21.7	0.357	188.8	1.2	-0.4	0.188	80.1	349.6	47.2	-4.7	304.9	117.9
2013-Dec-16	34.1E	20:02	-21.5	0.351	190.4	1.1	-0.5	0.178	79.8	349.5	47.9	-4.7	306.7	203.8
2013-Dec-17	33.3E	20:03	-21.3	0.345	192.0	0.9	-0.5	0.169	79.5	349.5	48.7	-4.7	308.3	289.8
2013-Dec-18	32.5E	20:03	-21.1	0.340	193.6	0.7	-0.6	0.160	79.2	349.4	49.5	-4.7	310.0	15.6
2013-Dec-19	31.6E	20:04	-20.8	0.334	195.2	0.5	-0.7	0.150	78.9	349.4	50.3	-4.7	311.6	101.5
2013-Dec-20	30.7E	20:04	-20.6	0.329	196.8	0.3	-0.8	0.141	78.6	349.4	51.1	-4.7	313.2	187.3
2013-Dec-21	29.7E	20:04	-20.4	0.324	198.5	0.1	-0.8	0.132	78.2	349.4	51.9	-4.6	314.7	273.1
2013-Dec-22	28.7E	20:04	-20.2	0.319	200.1	-0.1	-0.9	0.122	77.9	349.4	52.7	-4.6	316.2	358.8
2013-Dec-23	27.7E	20:04	-20.0	0.314	201.7	-0.4	-1.0	0.113	77.4	349.4	53.5	-4.6	317.7	84.5
2013-Dec-24	26.6E	20:03	-19.8	0.310	203.3	-0.6	-1.0	0.104	77.0	349.5	54.3	-4.6	319.1	170.1
2013-Dec-25	25.5E	20:02	-19.6	0.305	204.9	-0.8	-1.1	0.095	76.5	349.5	55.1	-4.5	320.4	255.7
2013-Dec-26	24.3E	20:02	-19.4	0.301	206.5	-1.0	-1.2	0.086	75.9	349.6	55.9	-4.5	321.8	341.3
2013-Dec-27	23.1E	20:01	-19.2	0.297	208.1	-1.3	-1.2	0.078	75.3	349.7	56.7	-4.4	323.1	66.8
2013-Dec-28	21.9E	19:59	-19.0	0.293	209.7	-1.5	-1.3	0.070	74.6	349.8	57.4	-4.4	324.3	152.3
2013-Dec-29	20.6E	19:58	-18.8	0.289	211.4	-1.8	-1.4	0.062	73.8	349.9	58.1	-4.3	325.5	237.7
2013-Dec-30	19.3E	19:57	-18.6	0.286	213.0	-2.0	-1.4	0.054	72.8	350.0	58.8	-4.3	326.7	323.1
2013-Dec-31	18.0E	19:55	-18.4	0.283	214.6	-2.3	-1.5	0.047	71.7	350.2	59.4	-4.2	327.8	48.5

GLOSSARY OF TERMS IN HEADING

- Date - Terrestrial Dates starting with January 1st and ending December 31st of each year.
 - Elong - Geocentric elongation West (W) or East (E) of the Sun in degrees.
 - R.A. - The Geocentric Right Ascension of the center of Venus in hours and minutes (hh:mm).
 - Dec - The Declination of the center of Venus in degrees.
 - Dist - The distance of Earth from Venus in Astronomical Units. NOTE: An Astronomical Unit is 92,955,621 miles or 149,597,892 km.
 - Ls - Planetocentric Longitude of the Sun, measured eastward in the planet's orbital plane from Venus' Northern Hemisphere's vernal equinox. (Also referred to as Areocentric Long).
 - De - Sub-Earth point (Planetocentric Declination of Earth) as seen from Earth with respect to Venus in degrees.
 - Ds - Sub-Solar point (Planetocentric Declination of Sun) as seen from the Sun with respect to Venus in degrees (positive to the north).
 - Phase - The fraction of the area of the apparent disk of Venus that is illuminated by the Sun. Equation: $k = (1 + \cos i) / 2$, where i = phase in degrees.
 - Defect - Sun-Venus-Earth position angle. Measured counterclockwise from north; 0° to 359°, to the point on the limb of the greatest defect of illumination.
 - Axis - Position angle of the North Pole of Venus with respect to the North Pole of the Earth.
 - Size - Apparent angular diameter in seconds of arc (twice the semidiameter).
 - Mag - Geocentric apparent Visual Magnitude.
 - CM - Planetographic longitude of the central meridian of Venus, in degrees.
 - CM-II - Planetographic longitude of the central meridian of Venus, in degrees, correlated to the higher atmosphere visible in UV light.
- NOTE: The Central Meridian is an imaginary line passing through the planetary poles of rotation and bisecting the planetary disk. This line is used to define what planetographic longitudes are present on the disk during an observing session.

Venus_2013

MOTION OF THE CENTRAL MERIDIAN OF VENUS

The tabulated values for the Central Meridian are listed for 0-hours UT in the Ephemeris
(Add the values below to the listed Central Meridian)

HR	Sys I DEGREES	Sys II DEGREES	HR	Sys I DEGREES	Sys II DEGREES	MIN	Sys I DEGREES	Sys II DEGREES	MIN	Sys I DEGREES	Sys II DEGREES
1	0.062	3.57	13	0.802	46.43	10	0.010	0.60	1	0.001	0.06
2	0.123	7.14	14	0.864	50.00	20	0.021	1.19	2	0.002	0.12
3	0.185	10.71	15	0.926	53.57	30	0.031	1.79	3	0.003	0.18
4	0.247	14.29	16	0.988	57.14	40	0.041	2.38	4	0.004	0.24
5	0.309	17.86	17	1.049	60.71	50	0.051	2.98	5	0.005	0.30
6	0.370	21.43	18	1.111	64.29				6	0.006	0.36
7	0.432	25.00	19	1.173	67.86				7	0.007	0.42
8	0.494	28.57	20	1.234	71.43				8	0.008	0.48
9	0.556	32.14	21	1.296	75.00				9	0.009	0.54
10	0.617	35.71	22	1.358	78.57						
11	0.579	39.29	23	1.420	82.14						
12	0.741	42.86									

Example: 0h UT CMI = 19.7. At 1413UT CMI = $19.7^{\circ} + 0.864^{\circ} + 0.010^{\circ} + 0.003^{\circ} = 20.6^{\circ}$
 Example: 0h UT CMII = 146.3. At 1413UT CMII = $146.3^{\circ} + 50.00^{\circ} + 0.60^{\circ} + 0.18^{\circ} = 197.1^{\circ}$