

Saturn UV Occultations

UVIS obtained 24 solar and 101 stellar occultation sequences. One of the solar occultation sequences (on 6/9/2008) captured both ingress and egress. A number of stellar occultation sequences captured independent occultations at different latitudes by two or three stars in Orion's sword. The solar occultations were EUV only, while the stellar occultations were both EUV and FUV. Table 1 gives a list of solar occultations, with date, start time, latitude and local solar time. Table 2 does that for stellar occultations and includes the name of the star that was occulted.

After the tables are time-series plots of the count rates as a function of distance from Saturn's center. These are given for selected wavelengths of interest as noted on the plots.

The UV occultations sample Saturn's thermosphere (pressure less than 10^{-7} bar). The Appendix after the tables describes derivation of temperature in the thermosphere derived from UVIS occultation measurements.

Relevant references include Shemansky and Liu, *Can. J. Phys.*, 90, 817-831 (2012); Koskinen et al., *Icarus*, 226, 1318-1330 (2013); Koskinen et al., *Icarus*, 260, 174-189 (2015); Koskinen and Guerlet, *Icarus*, 307, 161-171 (2018).

Table 1. Solar Occultations (EUV only)

PDS Label	Date	Start time (UT)	Lat (deg)	LST
EUV2007_130_14_53	5/10/07	14:53	71	15:21
EUV2007_321_04_30	11/17/07	4:30	-50	18:47
EUV2007_321_06_04	11/17/07	6:04	-55	5:03
EUV2007_337_07_24	12/3/07	7:24	-45	5:22
EUV2008_051_18_09	2/20/08	18:09	-75	20:06
EUV2008_062_03_09	3/2/08	3:09	-43	18:30
EUV2008_146_22_01	5/25/08	22:01	-39	18:21
EUV2008_161_00_19	6/9/08	0:19	23, -52	17.48,18:30
EUV2008_196_08_54	7/14/08	8:54	17	17:52
EUV2008_196_10_34	7/14/08	10:34	-46	18:25
EUV2010_044_03_44	2/13/10	3:44	31	18:06
EUV2010_061_22_33	3/2/10	22:33	24	5:54
EUV2010_079_08_33	3/20/10	8:33	35	18:09
EUV2010_096_22_14	4/6/10	22:14	40	18:12
EUV2010_137_23_20	5/17/10	23:20	36	5:47
EUV2010_265_16_36	9/22/10	16:36	18	5:52
EUV2012_157_02_21	6/5/12	2:21	44	5:02

EUV2012_246_20_41	9/2/12	20:41	44	4:57
EUV2012_331_07_12	11/26/12	7:12	-66	15:06
EUV2013_004_20_59	1/4/13	20:59	-72	10:52
EUV2013_111_15_58	4/21/13	15:58	-72	12:24
EUV2013_121_06_24	5/1/13	6:24	-71	12:52
EUV2013_163_03_36	6/12/13	3:36	-64	15:06

Table 2. Stellar Occultations

PDS Label	Date	Start time (UT)	Target	PgLat (deg)	LST
EUV/FUV2005_103_16_3					15:4
4	4/13/05	16:34	delta Orionis	-48	5
EUV/FUV2006_079_00_4					
2	3/20/06	0:42	epsilon Orionis	45	2:52
EUV/FUV2006_079_02_0					14:0
0	3/20/06	2:00	beta Orionis	-49	0
EUV/FUV2006_079_04_3					14:2
9	3/20/06	4:39	epsilon Orionis	38	7
EUV/FUV2006_079_05_3					14:3
2	3/20/06	5:32	zeta Orionis	27	7
EUV/FUV2006_079_10_4					
5	3/20/06	10:45	alpha Canis Minoris	68	5:54
EUV/FUV2006_118_05_5					13:5
9	4/28/06	5:59	beta Orionis	-48	5
EUV/FUV2006_118_08_4					14:2
4	4/28/06	8:44	epsilon Orionis	39	2
EUV/FUV2006_141_20_5					
5	5/21/06	20:56	beta Orionis	-37	2:15
EUV/FUV2006_141_22_1					
2	5/21/06	22:12	epsilon Orionis	30	2:38
EUV/FUV2006_142_00_0					13:5
5	5/22/06	0:05	beta Orionis	-32	8
EUV/FUV2006_142_01_0					14:2
5	5/22/06	1:05	epsilon Orionis	26	3
EUV/FUV2006_142_01_4					14:3
1	5/22/06	1:41	zeta Orionis	18	0
EUV/FUV2006_181_04_1					13:5
7	6/30/06	4:17	beta Orionis	-31	3
EUV/FUV2006_325_23_1					13:5
9	11/21/06	23:19	alpha Arae	6	0
EUV/FUV2007_002_19_3					12:1
	1/2/07	19:30	kappa Centauri	-11	

0					2
EUV/FUV2007_202_03_0					
1	7/21/07	3:01	delta Orionis	34	1:39
EUV/FUV2007_202_05_0					13:0
6	7/21/07	5:06	beta Orionis	-31	0
EUV/FUV2007_202_05_5					13:1
4	7/21/07	5:54	delta Orionis	40	2
EUV/FUV2007_202_06_1					13:2
7	7/21/07	6:17	epsilon Orionis	31	3
EUV/FUV2007_202_06_3					13:3
7	7/21/07	6:37	zeta Orionis	23	1
EUV/FUV2008_092_09_2					
0	4/1/08	9:20	alpha Arae	0.8	1:21
EUV/FUV2008_110_14_2					11:3
1	4/19/08	14:21	epsilon Centauri	-21	6
EUV/FUV2008_188_23_3					
0	7/6/08	23:30	beta Centauri	7.7	7:49
EUV/FUV2008_203_01_1					
7	7/21/08	1:17	beta Centauri	7.6	7:47
EUV/FUV2008_203_04_3					
4	7/21/08	4:34	beta Centauri	20	0:51
EUV/FUV2008_261_02_1					
5	9/17/08	2:15	beta Centauri	13	6:41
EUV/FUV2008_275_15_5					12:1
5	10/1/08	15:55	alpha Crucis	-22	8
EUV/FUV2008_290_12_0					
2	8	12:02	beta Centauri	13	6:38
EUV/FUV2008_343_19_5					
1	12/8/08	19:51	beta Centauri	10	7:05
EUV/FUV2008_351_19_0					19:0
8	8	19:08	alpha Crucis	2.1	0
EUV/FUV2008_351_22_3					
9	8	22:39	beta Centauri	22	1:11
EUV/FUV2009_003_04_2					18:2
0	1/3/09	4:20	beta Crucis	-4.2	9
EUV/FUV2009_022_04_3					13:5
9	1/22/09	4:39	beta Crucis	-24	3
EUV/FUV2009_022_08_0					18:2
0	1/22/09	8:00	beta Crucis	-4.1	8
EUV/FUV2009_031_22_0					
0	1/31/09	22:00	beta Centauri	-6.8	9:41
EUV/FUV2009_163_15_0					
2	6/12/09	15:02	zeta Centauri	-18	9:57
EUV/FUV2010_186_11_0					
	7/5/10	11:07	alpha Virginis	-5.9	7:10

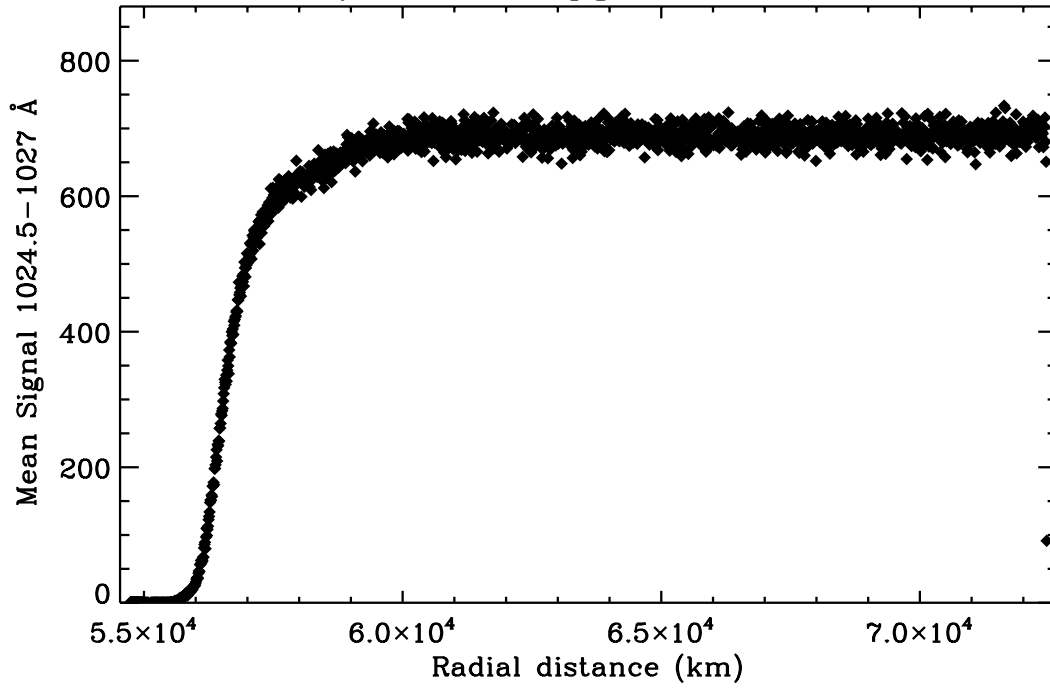
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9	3/10/13	15:19		kappa Velorum	10	7
EUV/FUV2013_141_05_3						
6	5/21/13	5:36		theta Carinae	-15	3:58
EUV/FUV2014_276_06_1						
7	10/3/14	6:17		zeta Puppis	-7.4	9:47
EUV/FUV2015_008_09_2						10:1
0	1/8/15	9:20		alpha Virginis	-72	5
EUV/FUV2015_010_12_0						
1	1/10/15	12:01		gamma Pegasi	9.5	2:09
EUV/FUV2015_049_21_1						19:5
0	2/18/15	22:14		kappa Orionis	2	4
EUV/FUV2015_050_18_0						
7	2/19/15	18:07		kappa Orionis	18	8:02
EUV/FUV2015_274_09_2						19:2
3	10/1/15	9:23		zeta Orionis	28	6
EUV/FUV2015_274_09_2						19:2
3	10/1/15	9:23		epsilon Orionis	39	8
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5	10/1/15	16:35		zeta Orionis	35	7:31
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4	10/15/1	5		zeta Orionis	29	5
EUV/FUV2015_288_06_5						19:2
4	10/15/1	5		epsilon Orionis	40	6
EUV/FUV2015_288_06_5						19:3
4	10/15/1	5		delta Orionis	52	8
EUV/FUV2015_302_11_4						
5	10/29/1	5	11:45	zeta Orionis	30	7:15
EUV/FUV2015_328_17_2						19:1
3	11/24/1	5	17:23	epsilon Orionis	30	7
EUV/FUV2015_328_17_2						19:2
3	11/24/1	5	17:23	delta Orionis	43	2
EUV/FUV2015_341_17_1						
5	12/7/15	17:15		epsilon Orionis	41	6:55
EUV/FUV2015_354_11_0						
9	12/20/1	5	11:09	epsilon Orionis	43	6:53
EUV/FUV2016_014_21_0						19:1
	1/14/16	21:05		epsilon Orionis	30	

5						0
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5	2/14/16	2:15	alpha Virginis	5.4	2:38	
EUV/FUV2016_045_08_5						
0	2/14/16	8:50	alpha Virginis	1.5	8:50	
EUV/FUV2016_046_23_3						
0	2/15/16	23:30	gamma Orionis	70	4:39	
EUV/FUV2016_094_18_0					18:4	
1	4/3/16	18:01	gamma Orionis	0.6	3	
EUV/FUV2016_296_06_4	10/22/1				16:1	
0	6	6:40	zeta Centauri	17	8	
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3	6	13:13	beta Crucis	-7.4	2:07	
EUV/FUV2017_009_00_5						
5	1/9/17	0:55	alpha Crucis	-16	3:30	
EUV/FUV2017_087_21_5						
3	3/28/17	21:53	beta Crucis	-6.1	1:41	
EUV/FUV2017_139_19_5			alpha Canis			
8	5/19/17	19:58	Majoris	-66	4:16	
EUV/FUV2017_146_05_3			alpha Canis			
9	5/26/17	5:39	Majoris	-76	0:09	
EUV/FUV2017_175_19_3						
1	6/24/17	19:31	epsilon Orionis	-74	6:40	
EUV/FUV2017_175_20_3						
6	6/24/17	20:36	zeta Orionis	-84	7:29	
EUV/FUV2017_176_06_4						
0	6/25/17	6:40	epsilon Orionis	15	5:48	
EUV/FUV2017_176_11_1						
7	6/25/17	11:17	zeta Orionis	29	4:48	
EUV/FUV2017_178_14_3						
2	6/27/17	14:32	beta Canis Majoris	-69	3:44	
EUV/FUV2017_182_06_1					12:4	
5	7/1/17	6:15	epsilon Orionis	-86	2	
EUV/FUV2017_182_08_4					16:4	
3	7/1/17	8:43	zeta Orionis	-81	9	
EUV/FUV2017_182_20_4						
0	7/1/17	20:40	epsilon Orionis	37	5:40	
EUV/FUV2017_183_00_4						
7	7/2/17	0:47	zeta Orionis	48	5:43	
EUV/FUV2017_185_17_2						
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EUV/FUV2017_188_17_4	7/7/17	17:43	epsilon Orionis	-75	16:5	

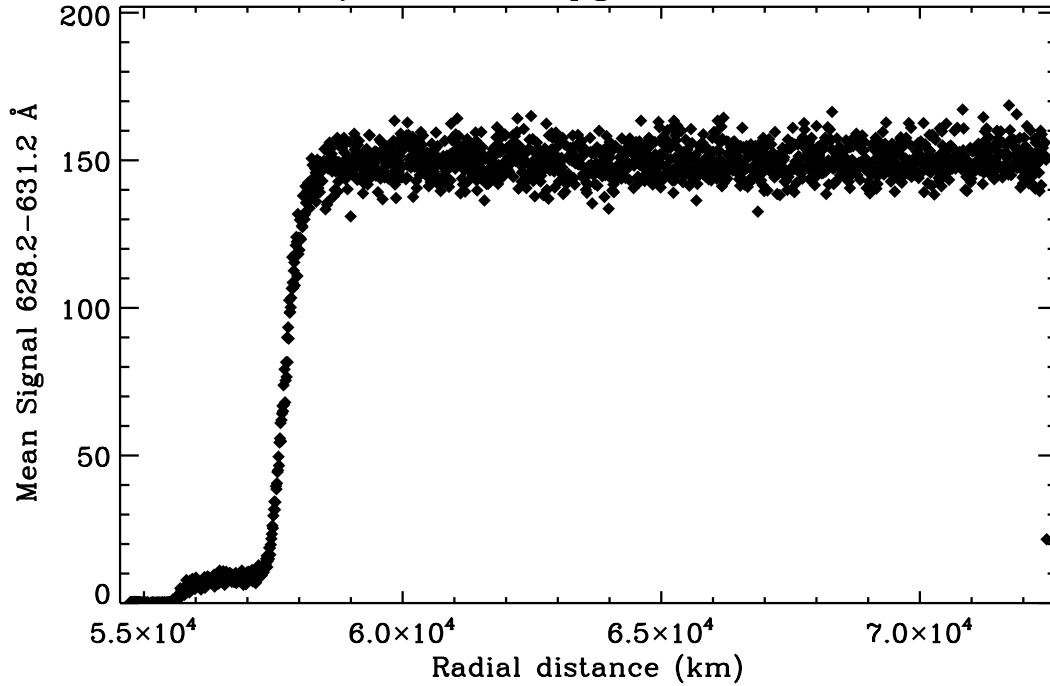
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4	7/8/17	9:54	epsilon Orionis	55	5:30
EUV/FUV2017_192_06_2					
5	7/11/17	6:25	beta Canis Majoris	59	8:08
EUV/FUV2017_194_14_5					17:0
2	7/13/17	14:52	gamma Orionis	-40	2
EUV/FUV2017_195_02_0					21:2
0	7/14/17	2:00	gamma Orionis	77	3
EUV/FUV2017_195_05_1					17:2
7	7/14/17	5:17	epsilon Orionis	-61	4
EUV/FUV2017_195_08_3					17:4
5	7/14/17	8:35	zeta Orionis	-51	0
EUV/FUV2017_195_21_4					
4	7/14/17	21:44	epsilon Orionis	73	5:04
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1	7/17/17	18:21	beta Canis Majoris	70	9:29
EUV/FUV2017_201_17_4					17:3
2	7/20/17	17:42	epsilon Orionis	-45	4
EUV/FUV2017_201_21_4					17:4
1	7/20/17	21:41	zeta Orionis	-33	5
EUV/FUV2017_202_09_0					
4	7/21/17	9:04	epsilon Orionis	86	0:07
EUV/FUV2017_202_11_3					18:4
1	7/21/17	11:31	zeta Orionis	78	1
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8	7/21/17	21:18	kappa Orionis	-82	0
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1	7/24/17	5:21	beta Canis Majoris	76	9
EUV/FUV2017_209_09_0					18:4
2	7/28/17	9:02	kappa Orionis	-65	2
EUV/FUV2017_210_04_2					
2	7/29/17	4:22	kappa Orionis	66	6:43
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Occultation Plots

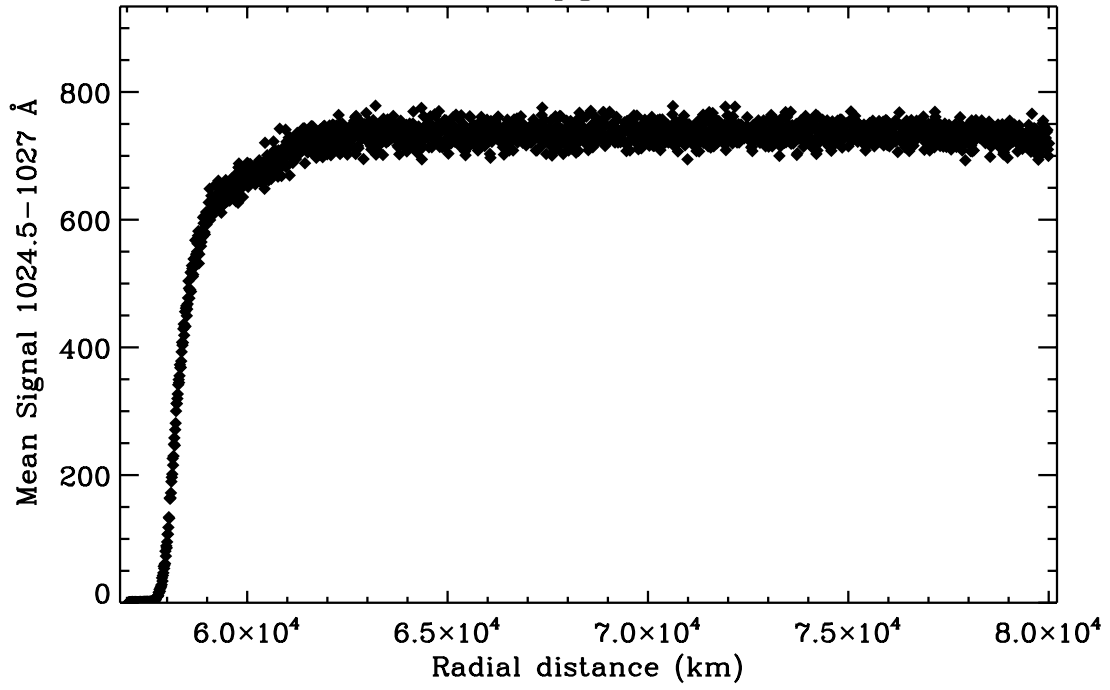
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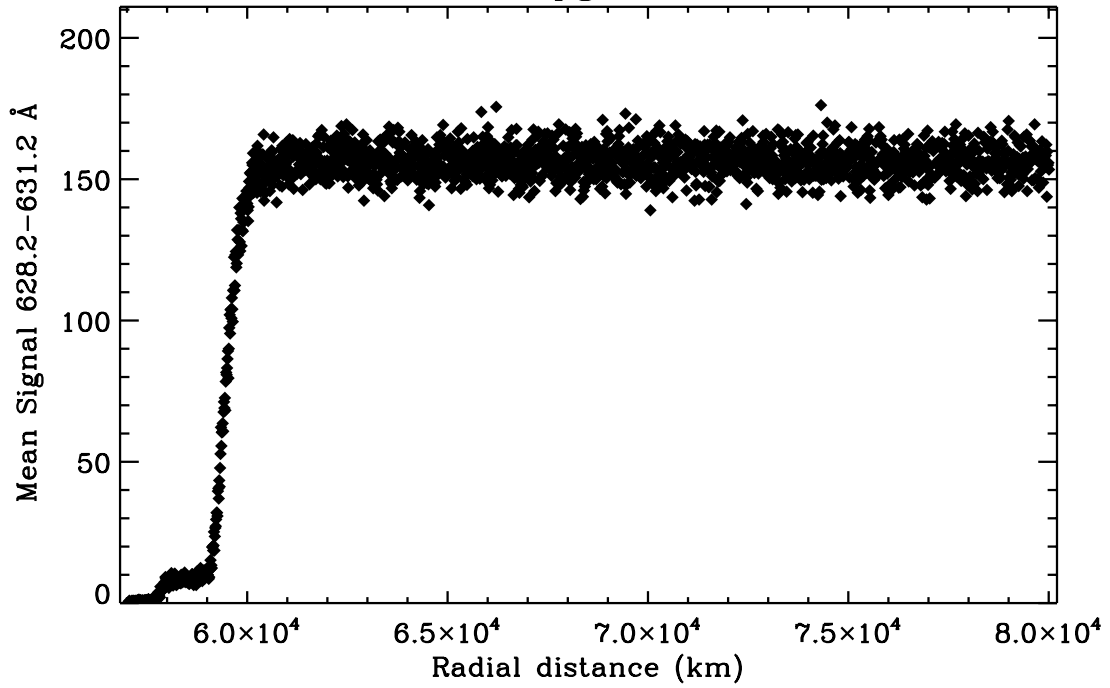
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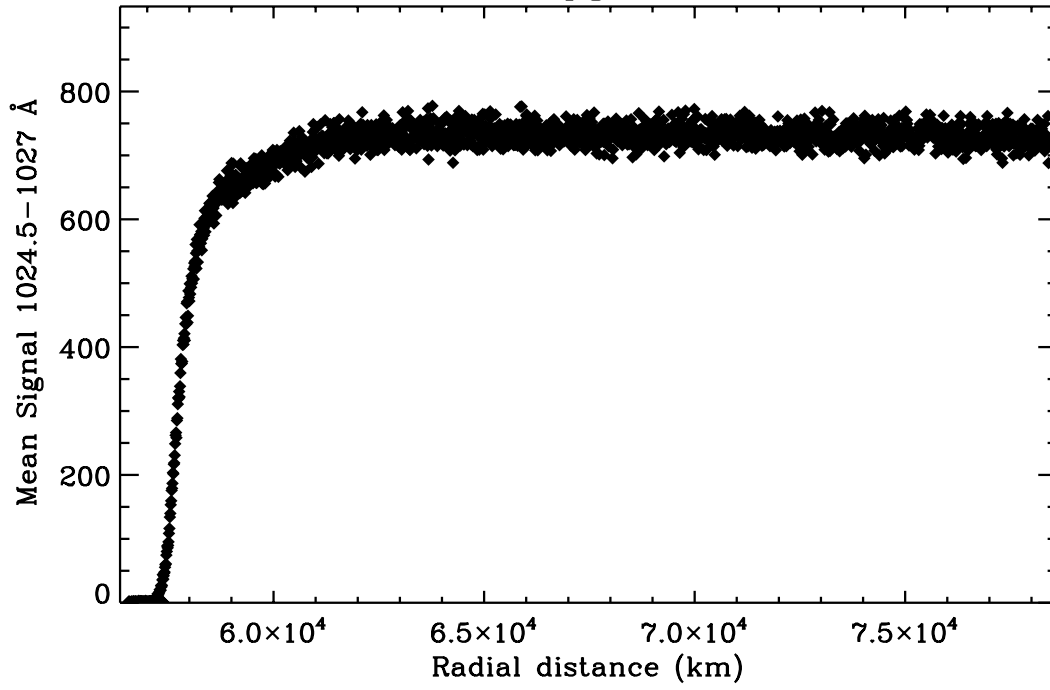
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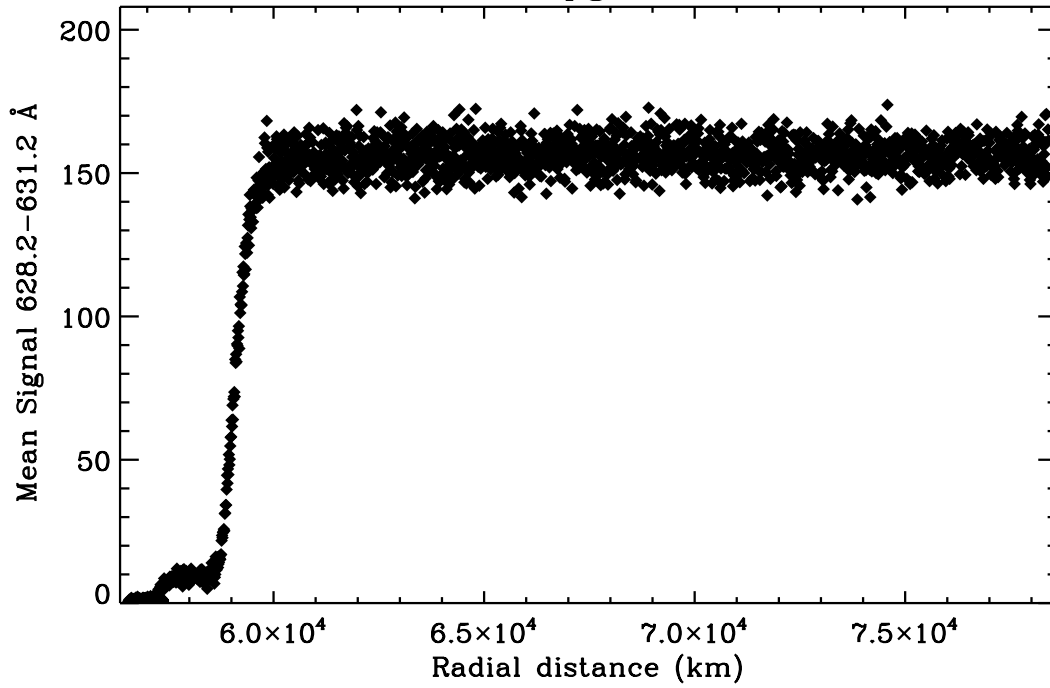
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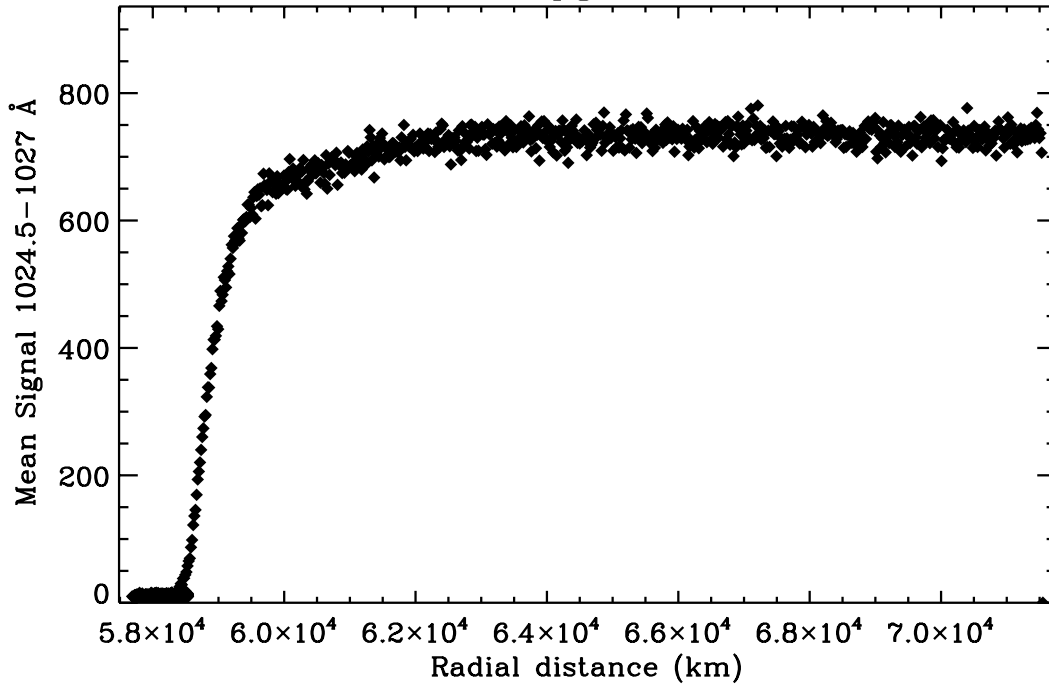
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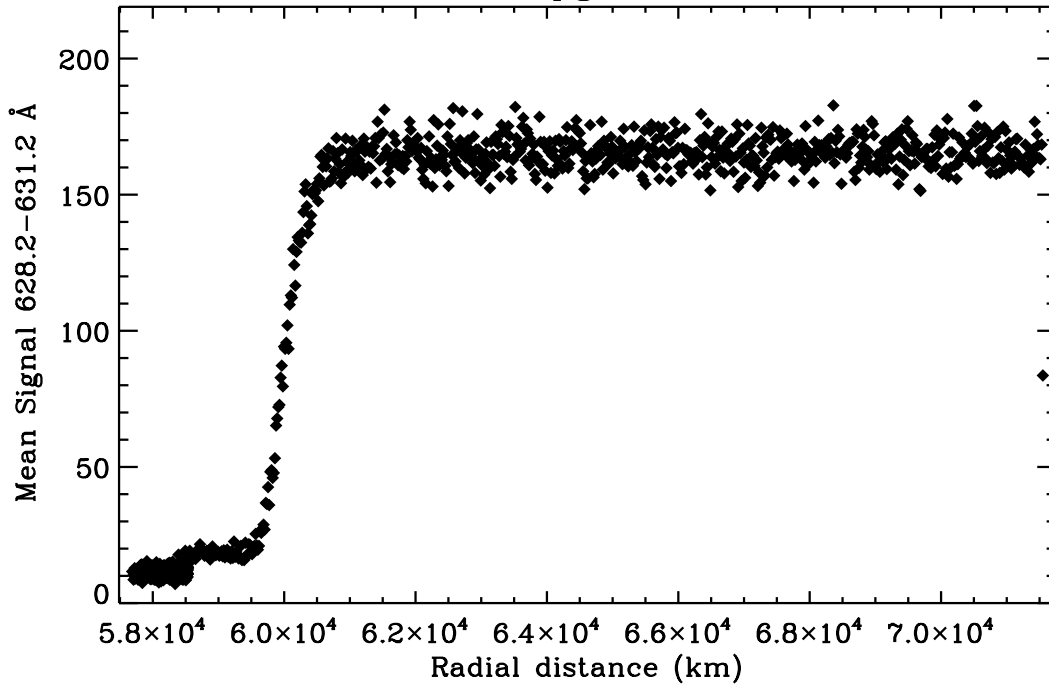
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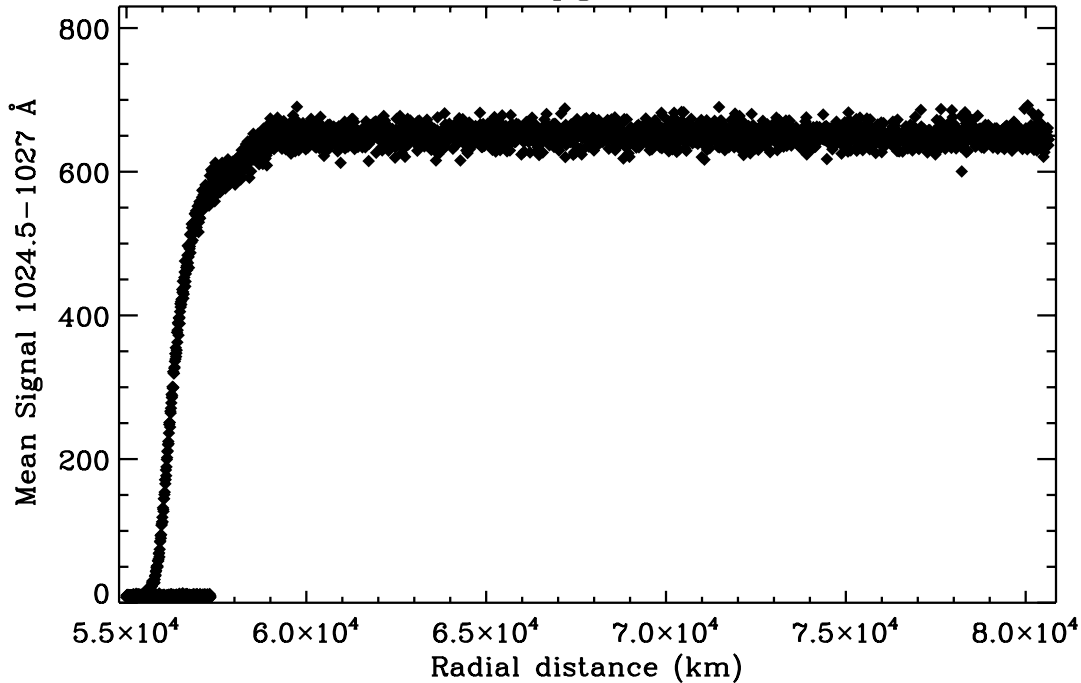
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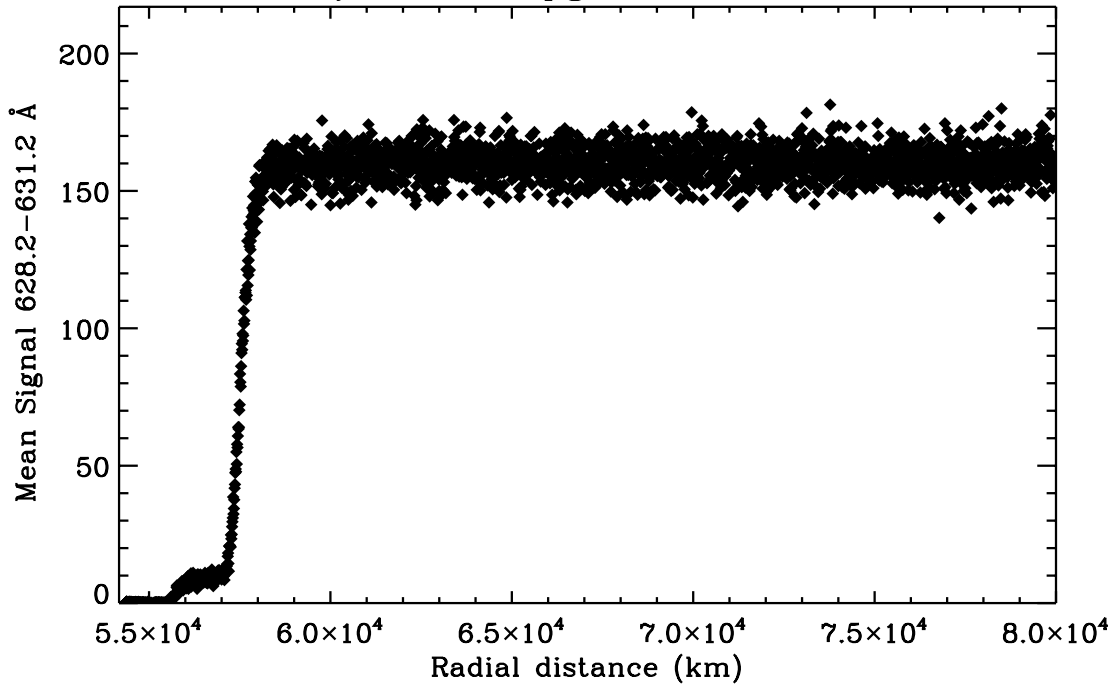
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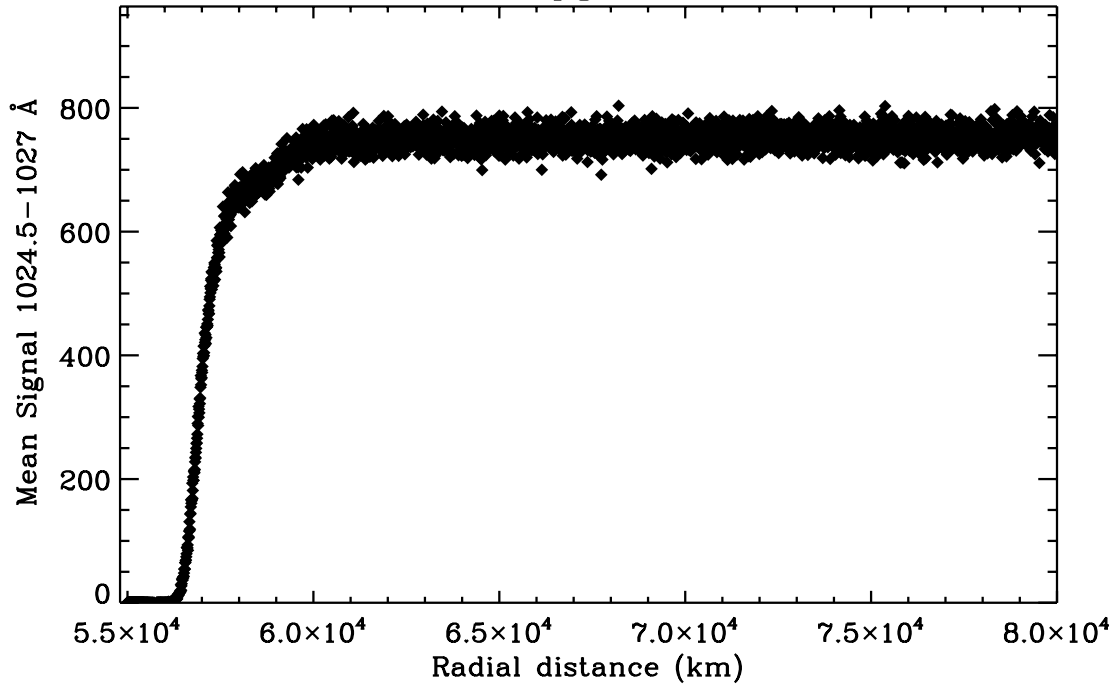
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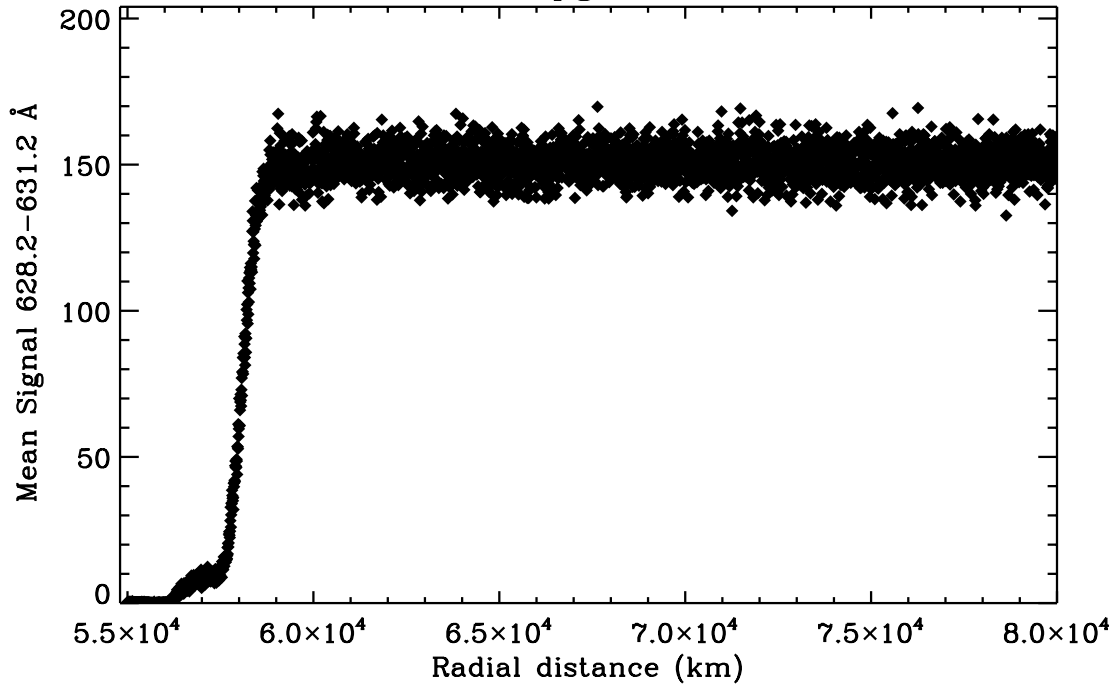
SUN May 1, 2013 pgLat: -71° LST: 12:52



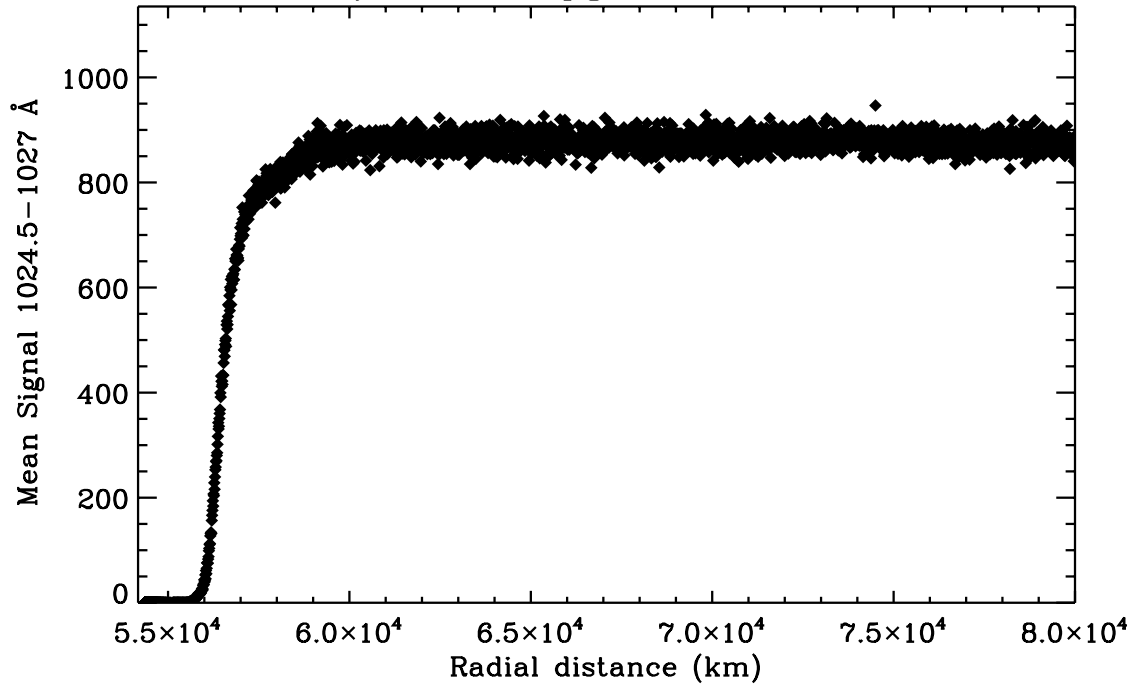
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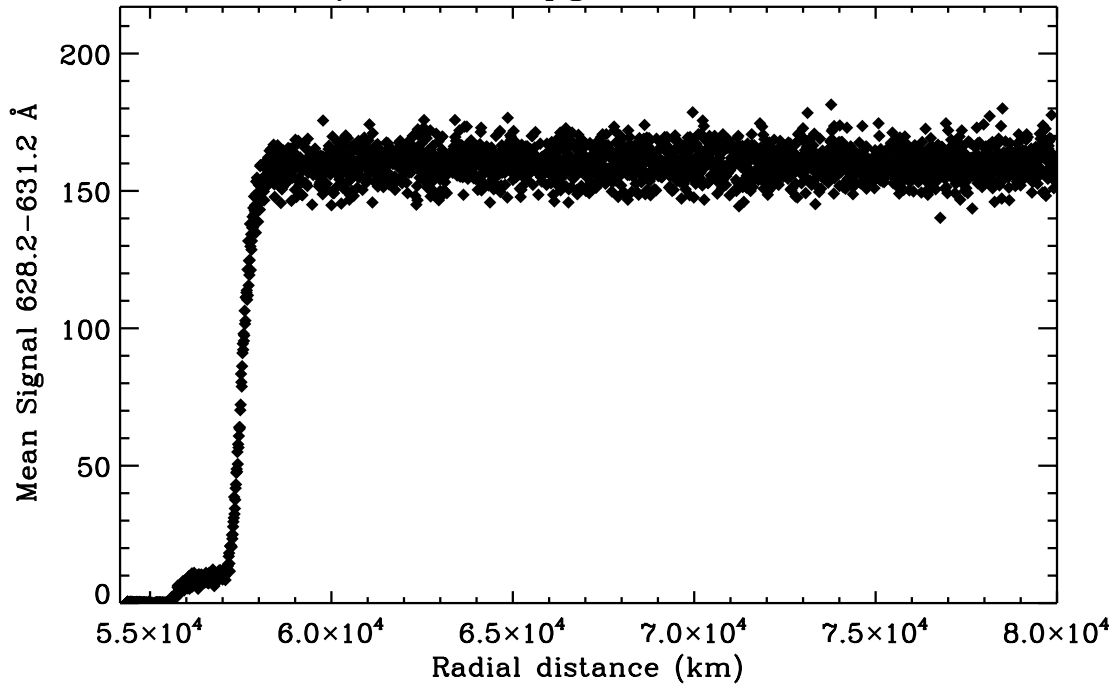
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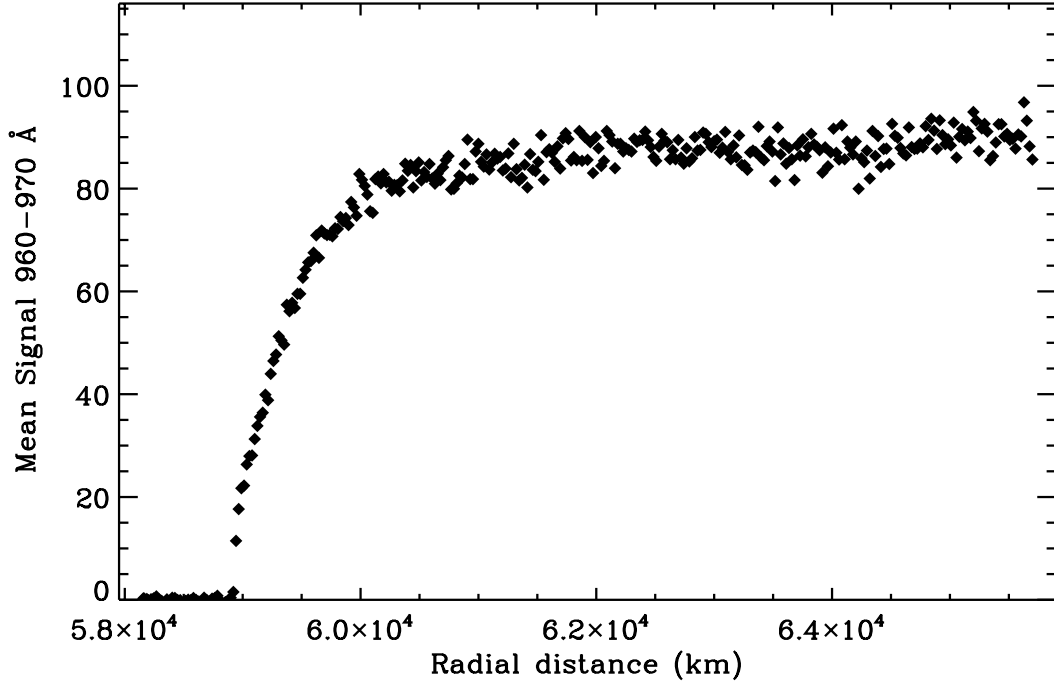


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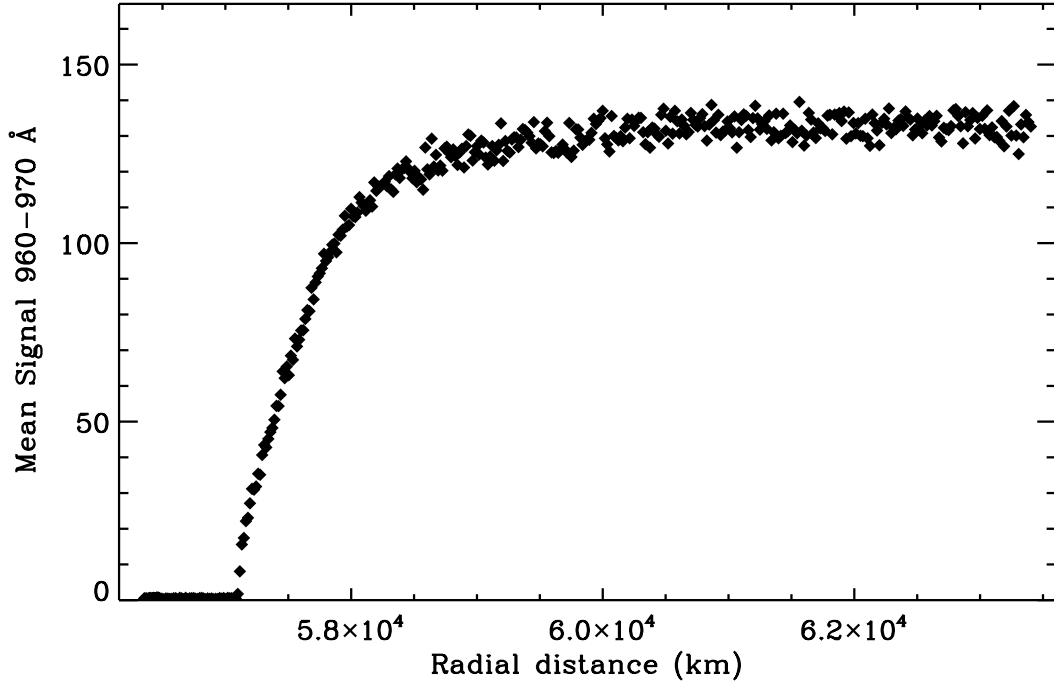


----- End of Solar Occultation Plots -----

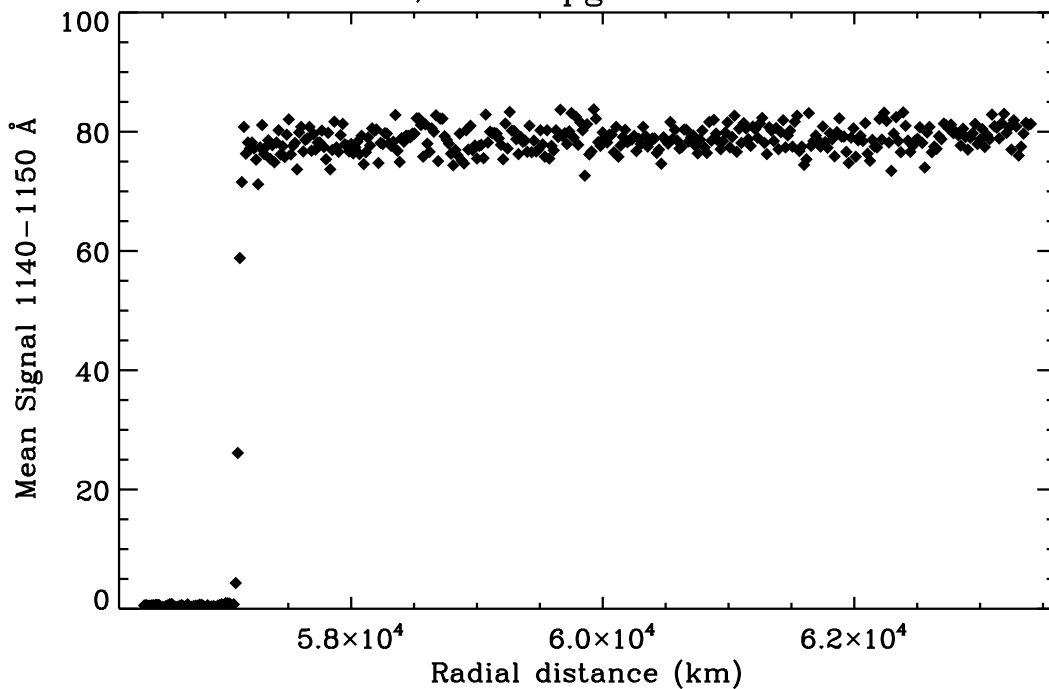
ϵ Ori Oct 1, 2015 pgLat: 39° LST: 19:28



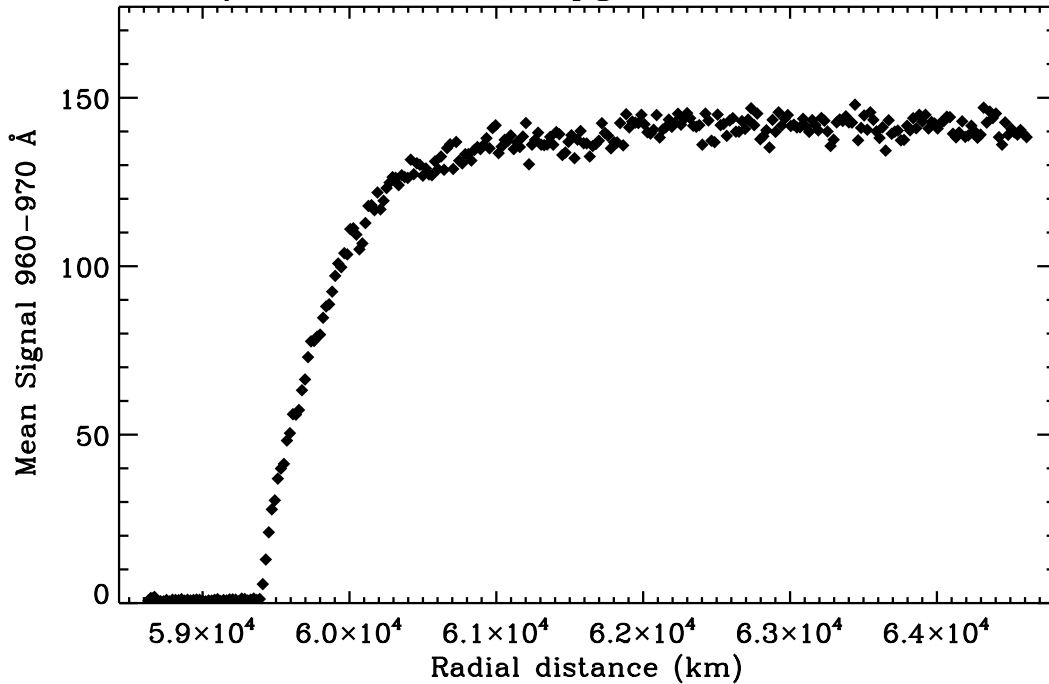
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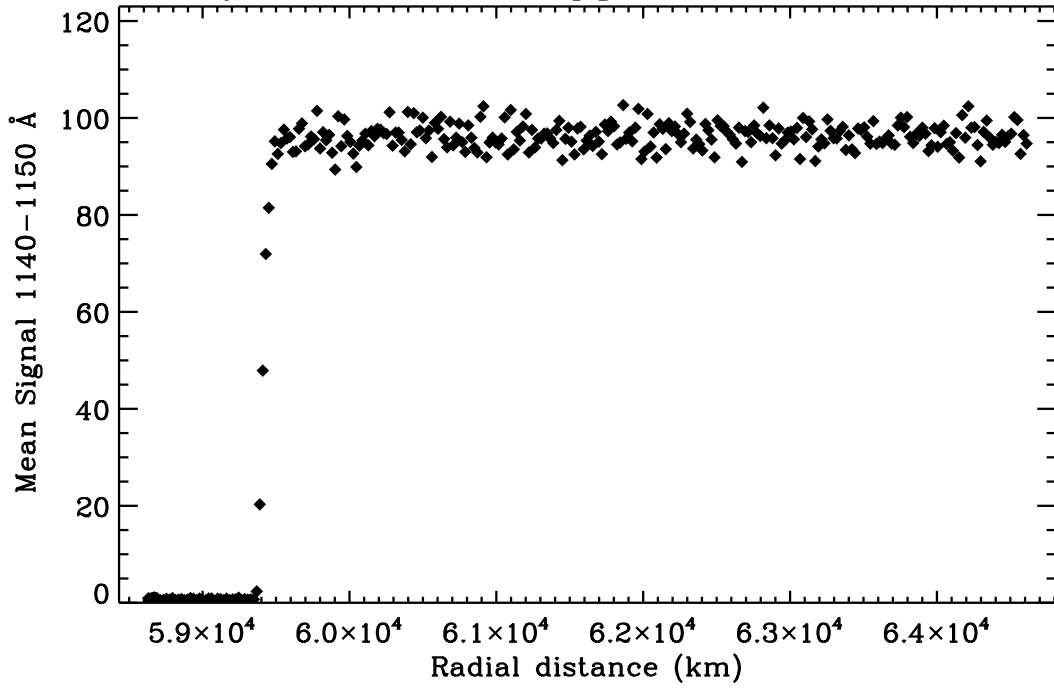
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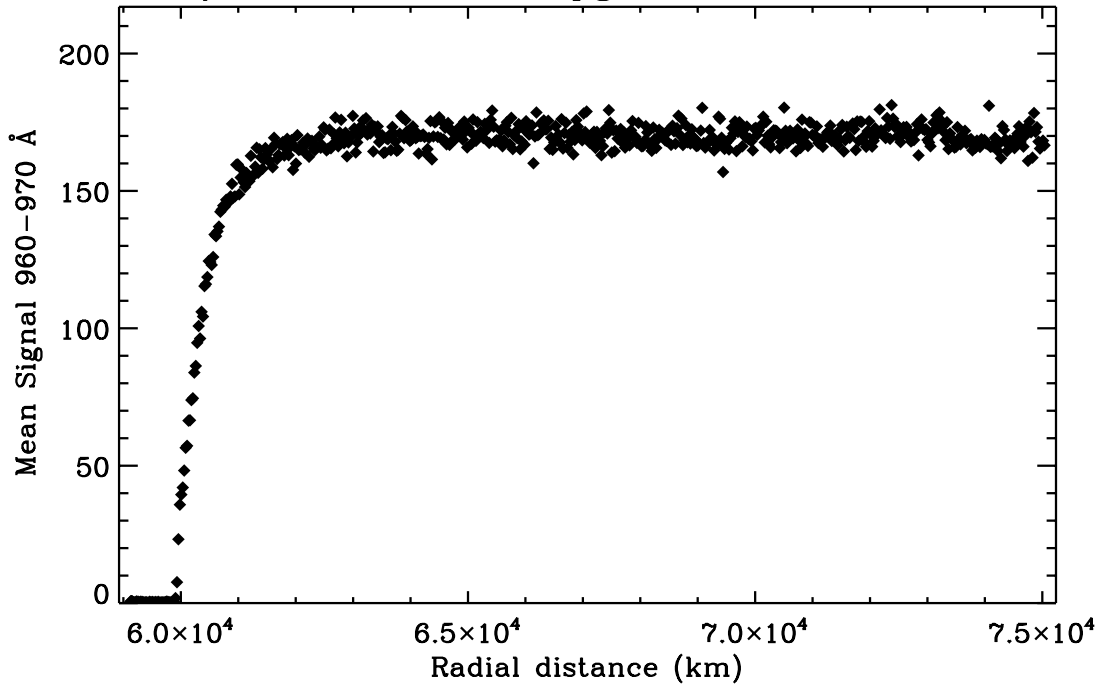
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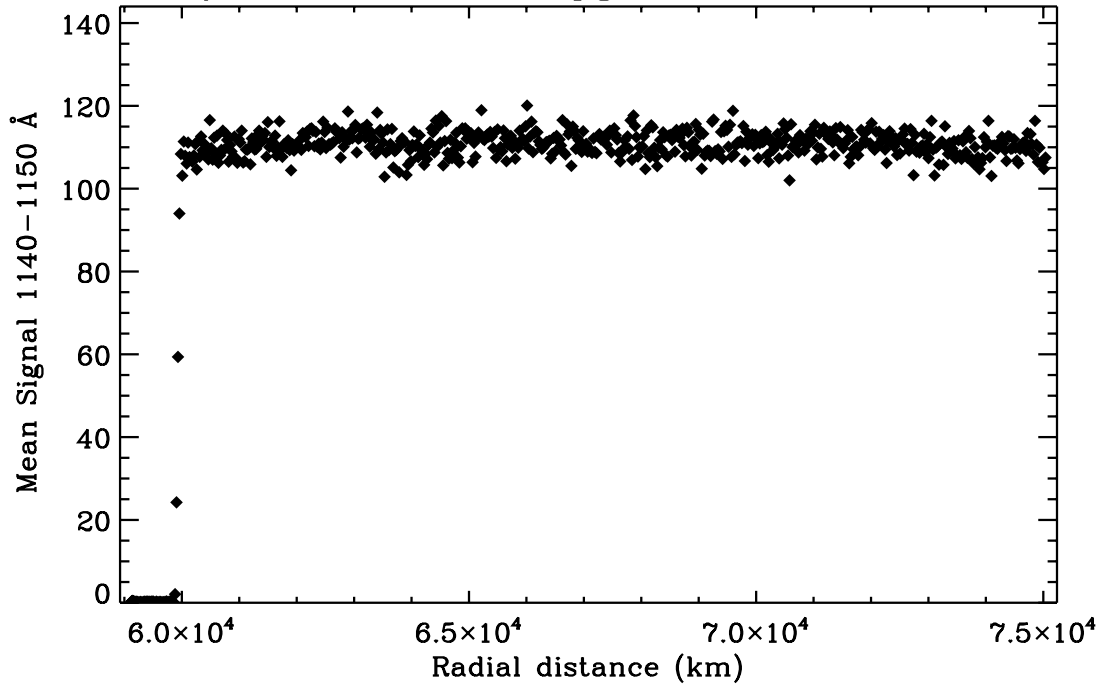
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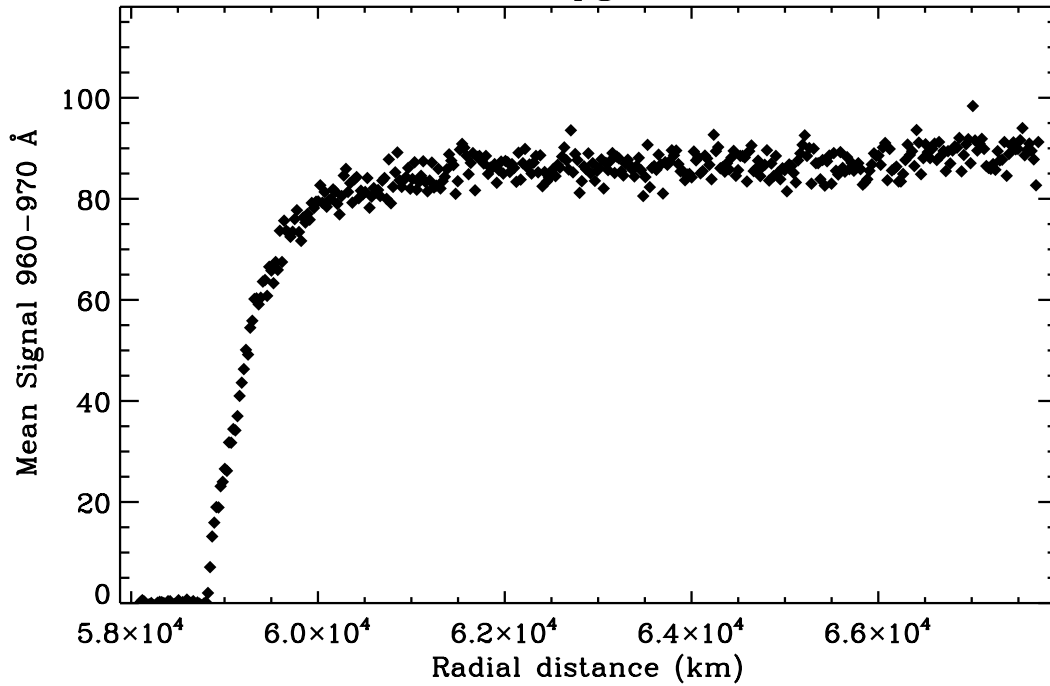
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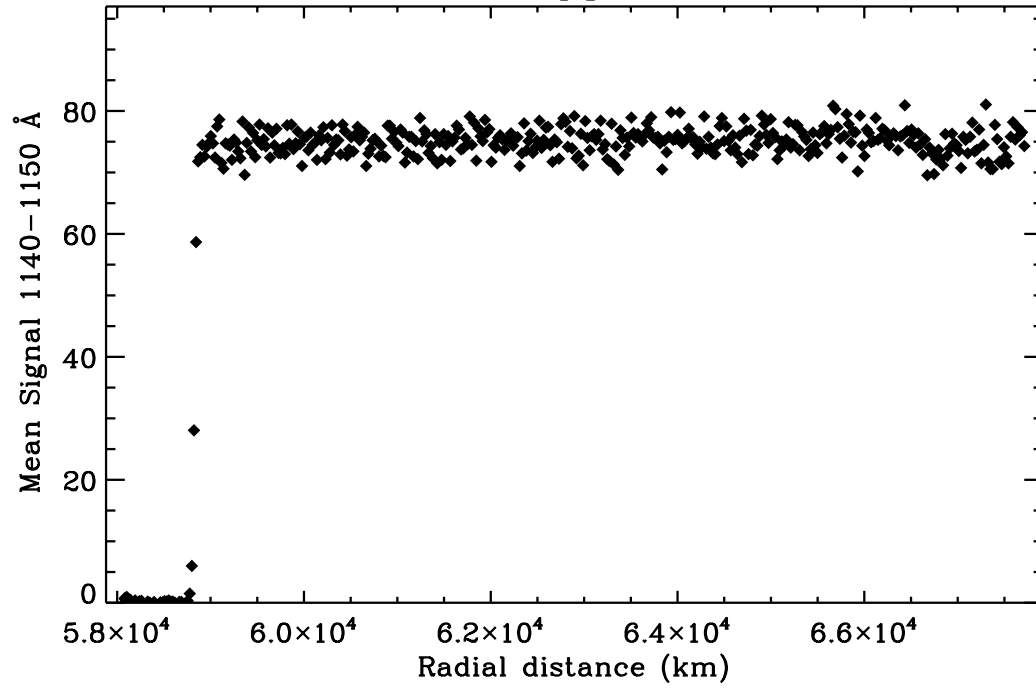
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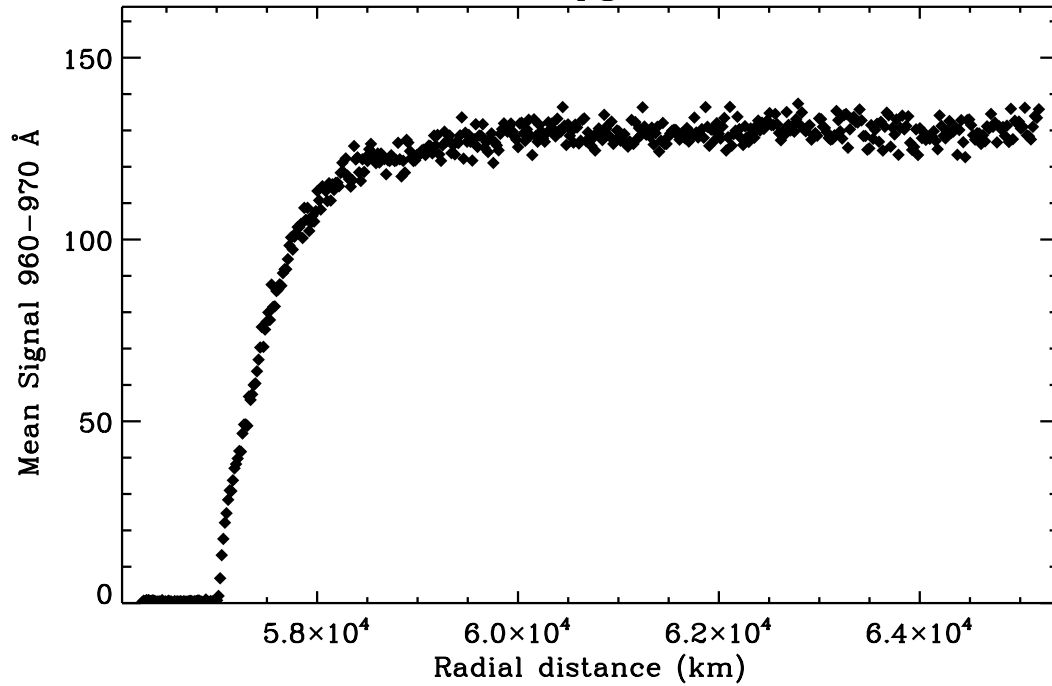
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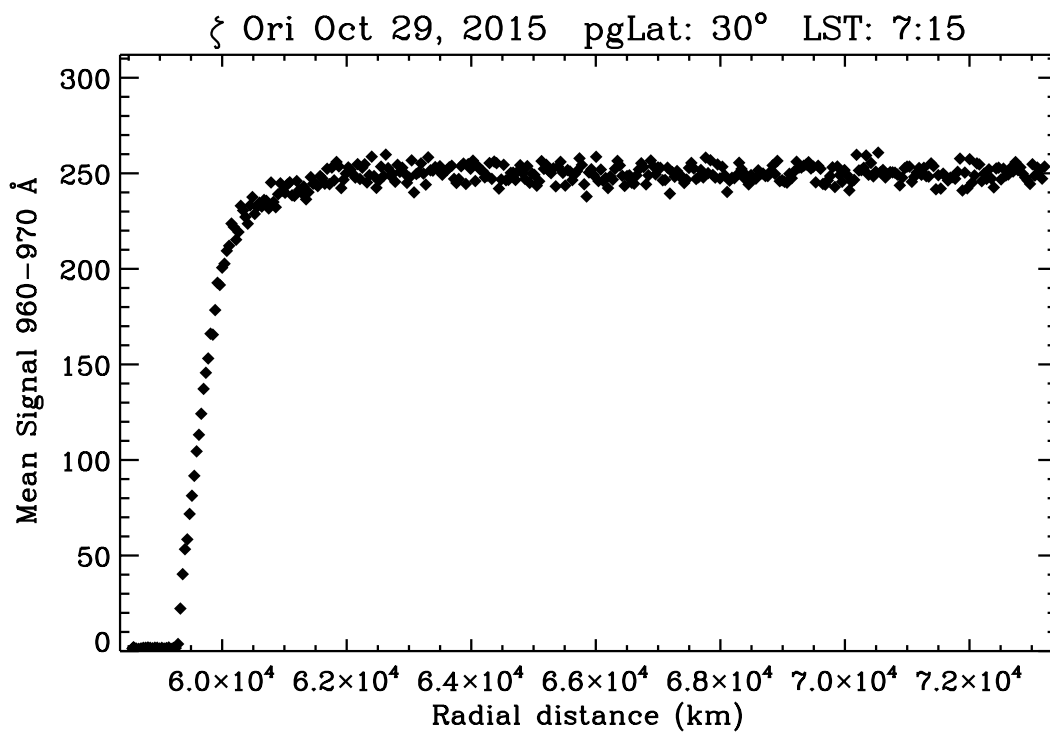
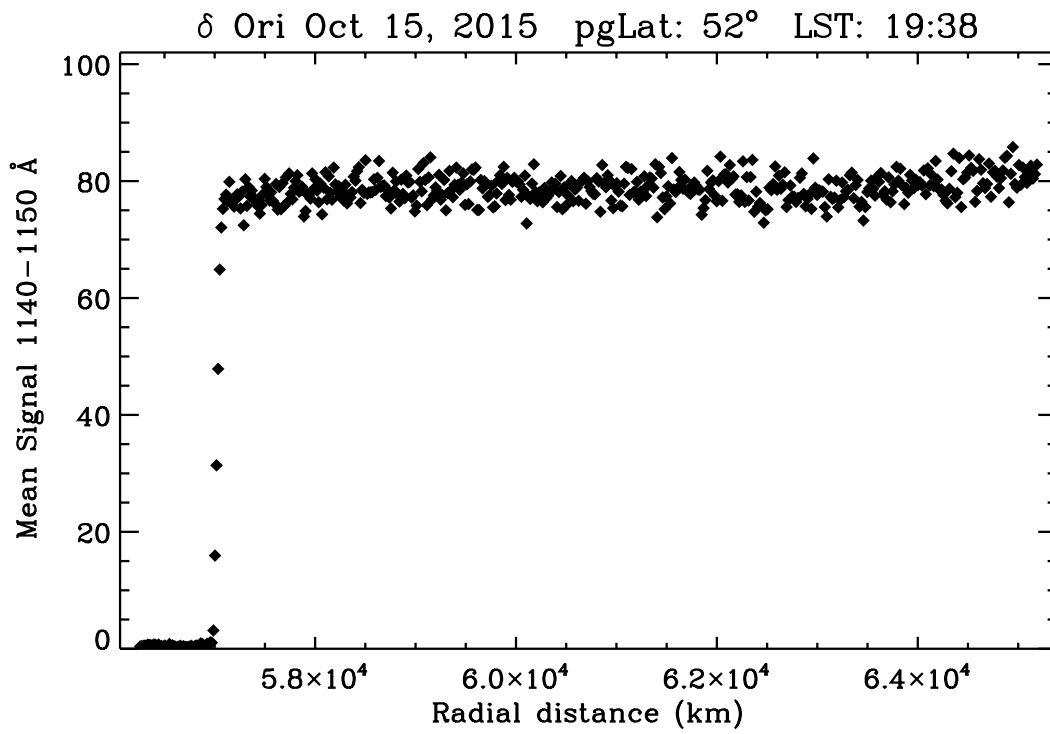


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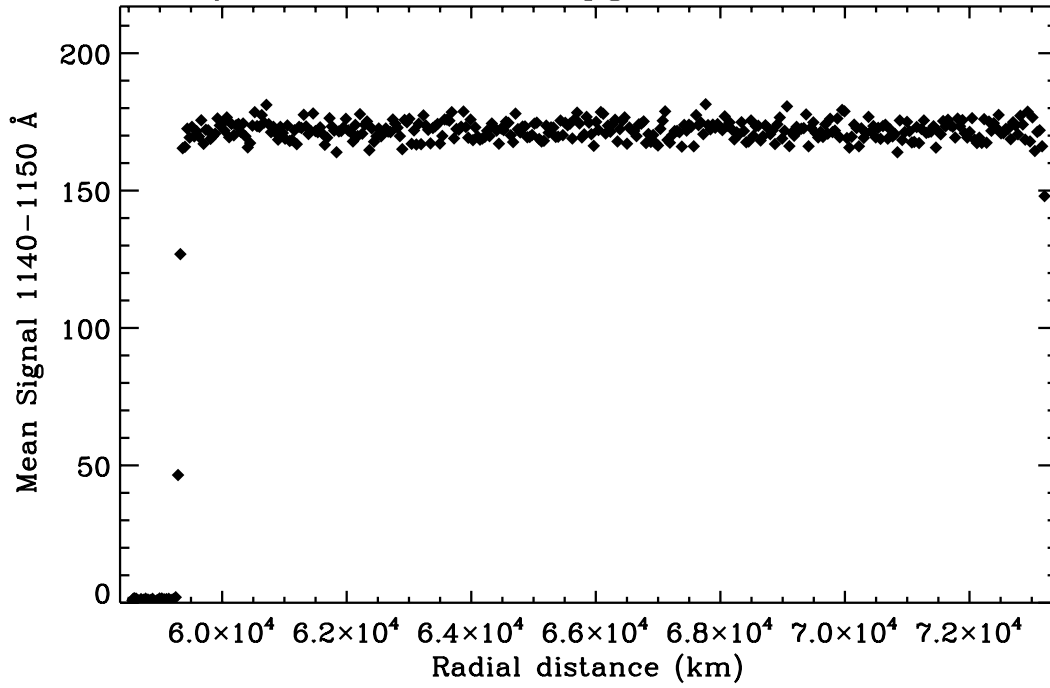


δ Ori Oct 15, 2015 pgLat: 52° LST: 19:38

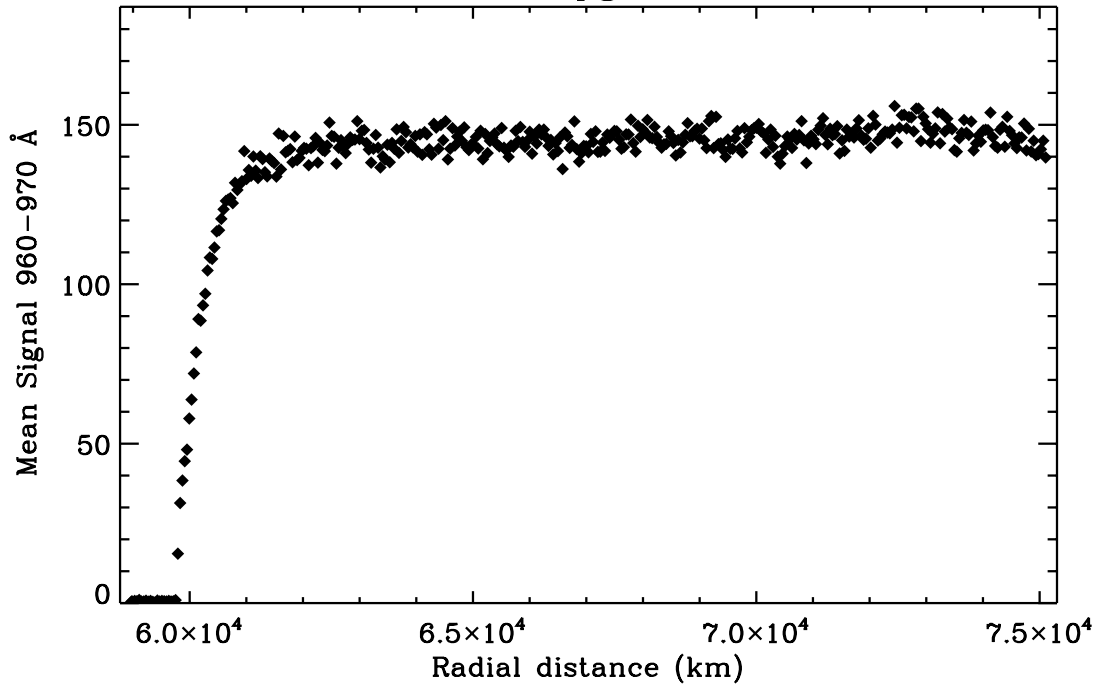




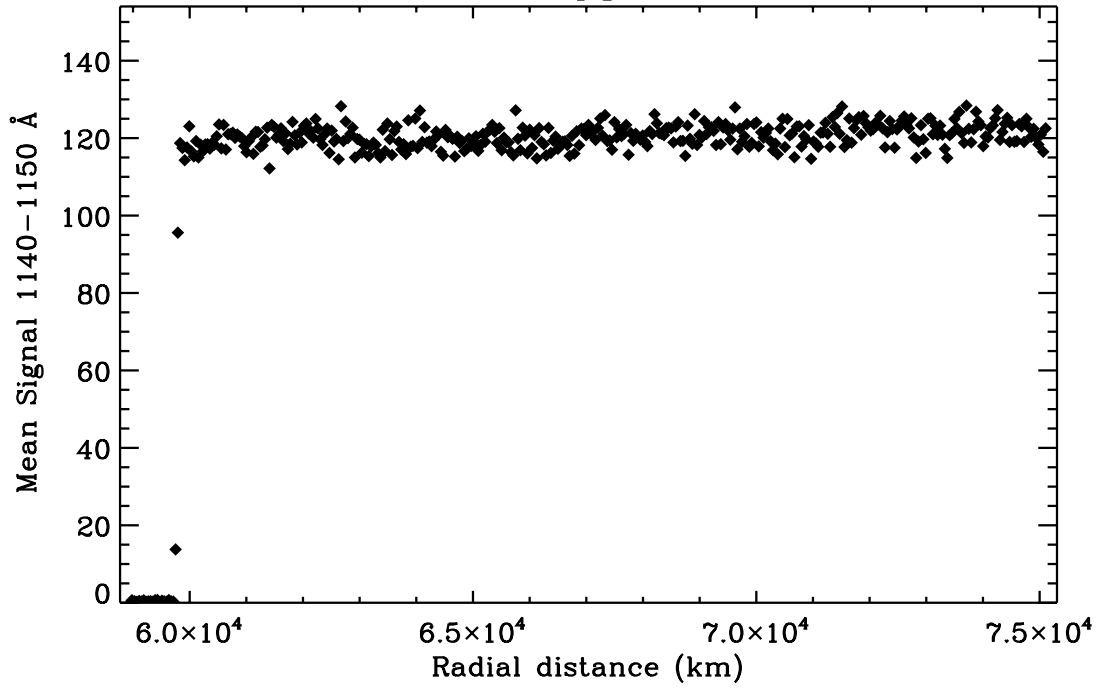
ζ Ori Oct 29, 2015 pgLat: 30° LST: 7:15



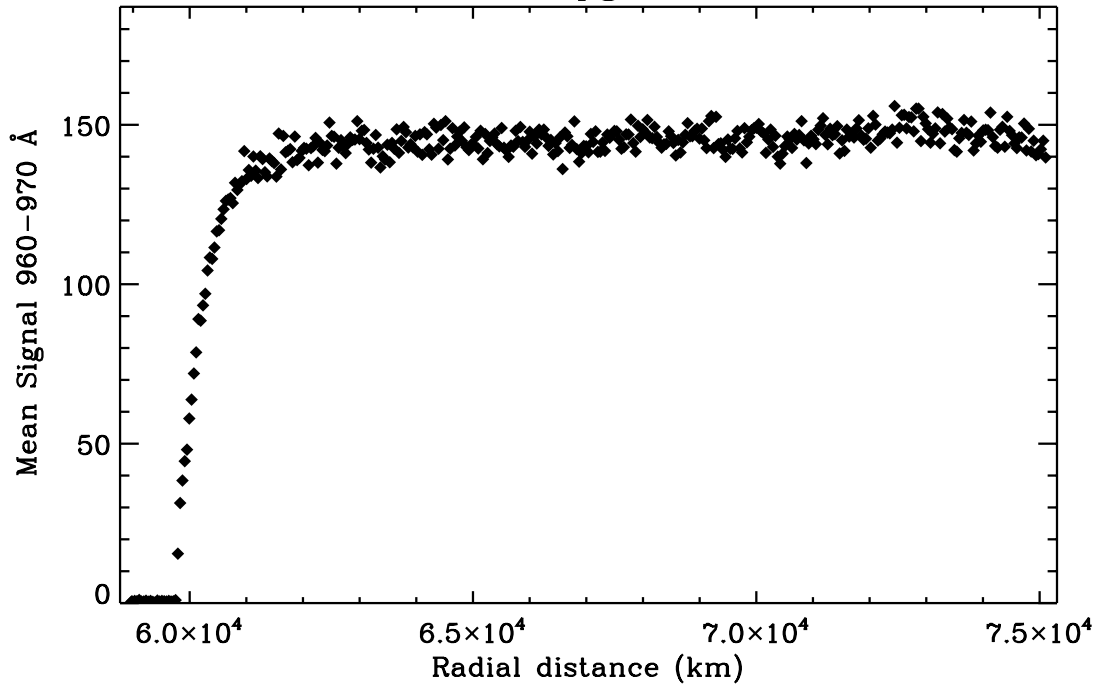
ε Ori Nov 24, 2015 pgLat: 30° LST: 19:17



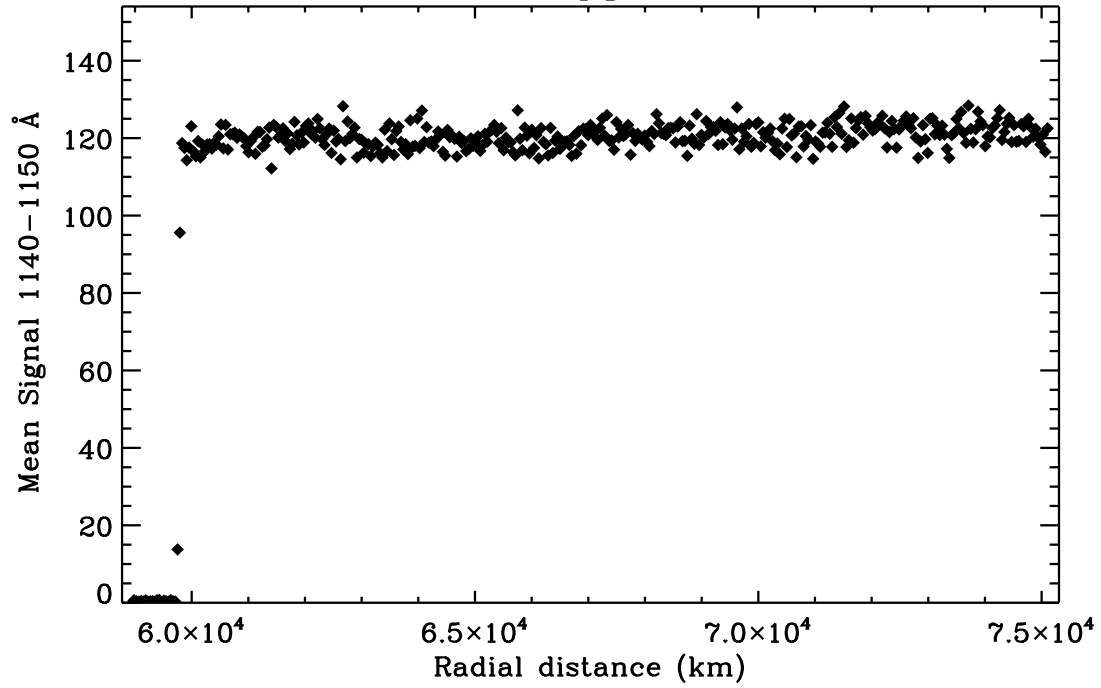
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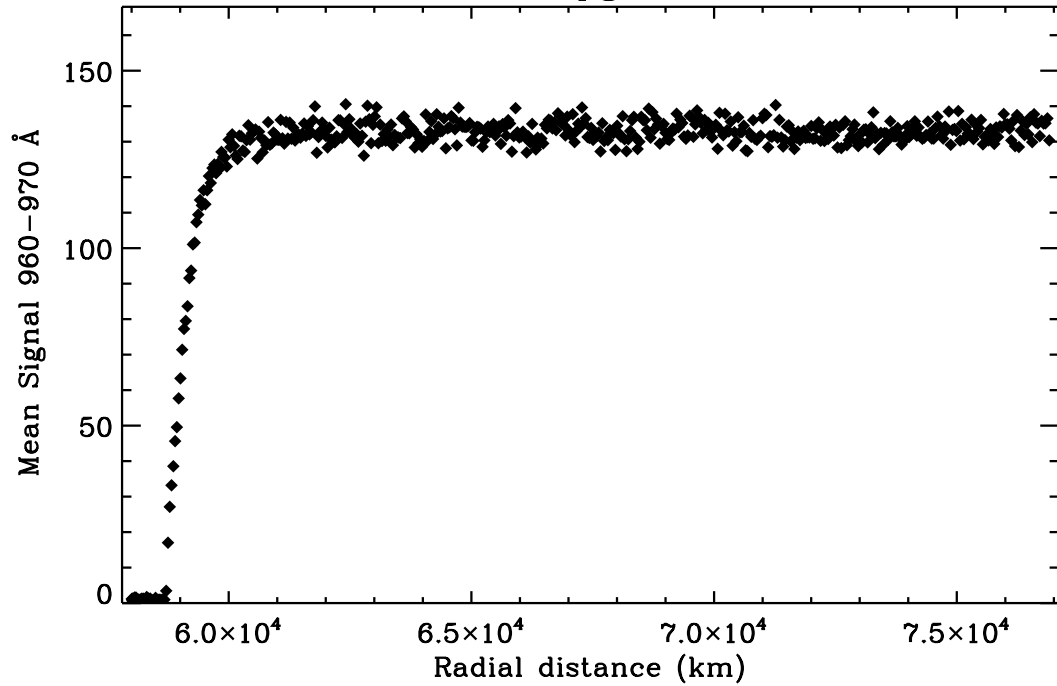
δ Ori Nov 24, 2015 pgLat: 43° LST: 19:22



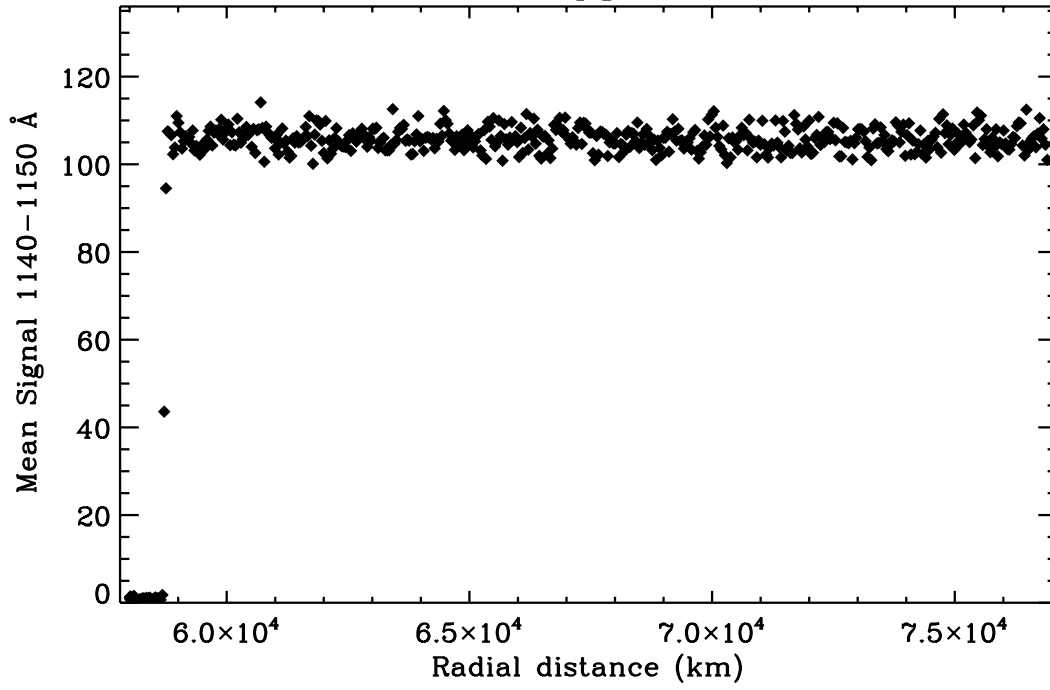
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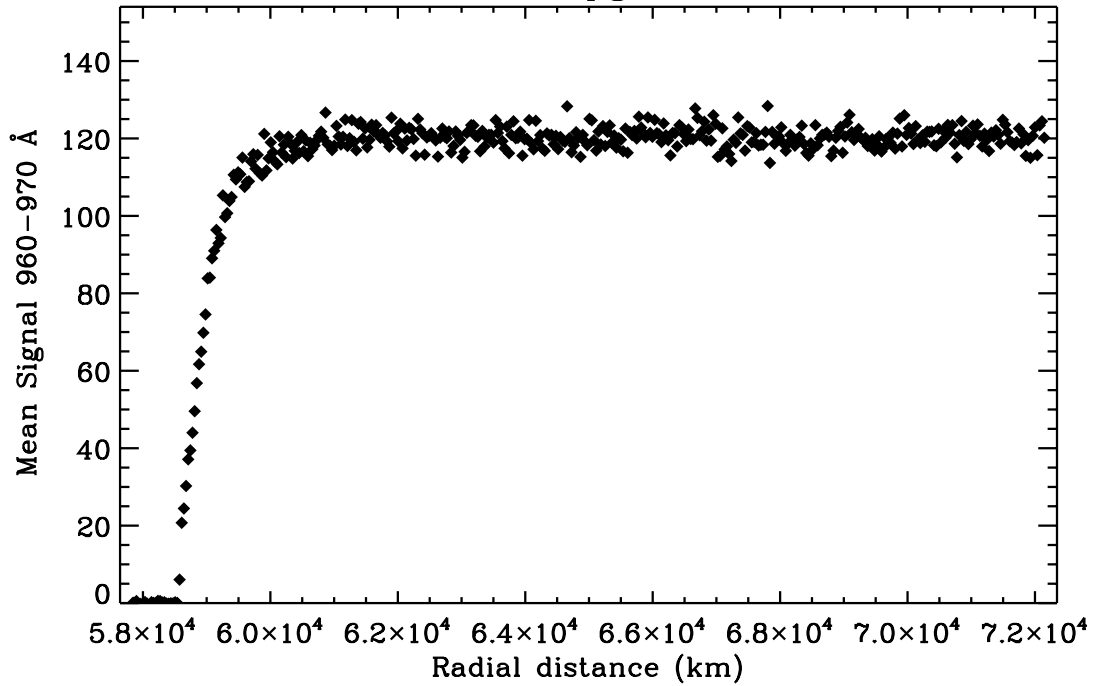
ϵ Ori Dec 7, 2015 pgLat: 41° LST: 6:55



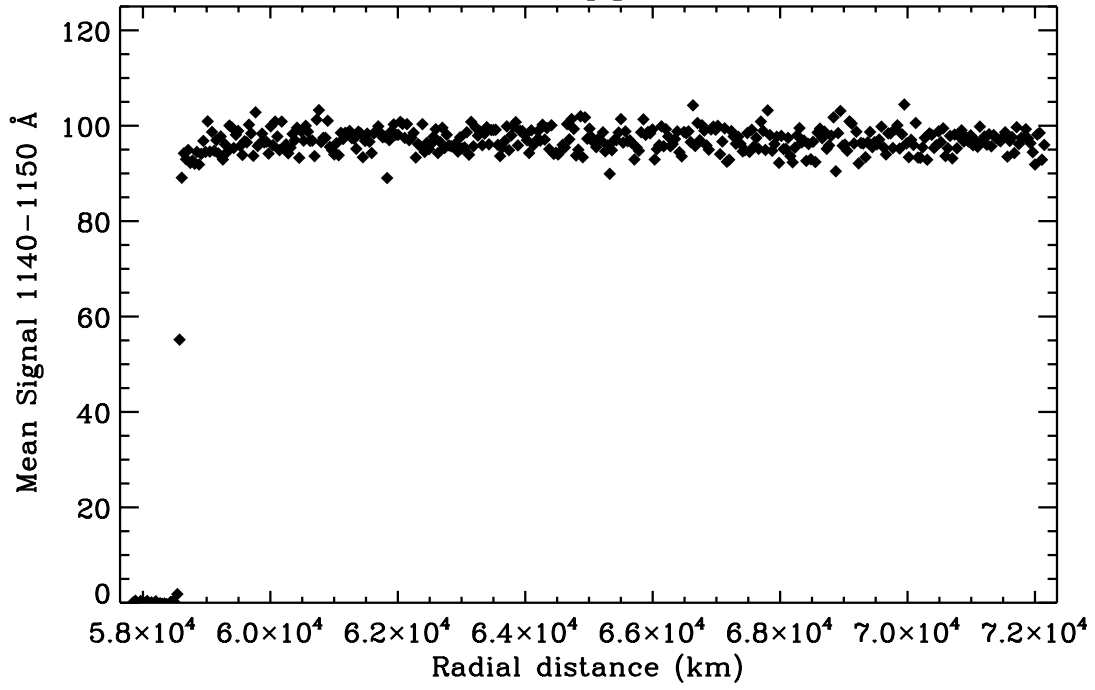
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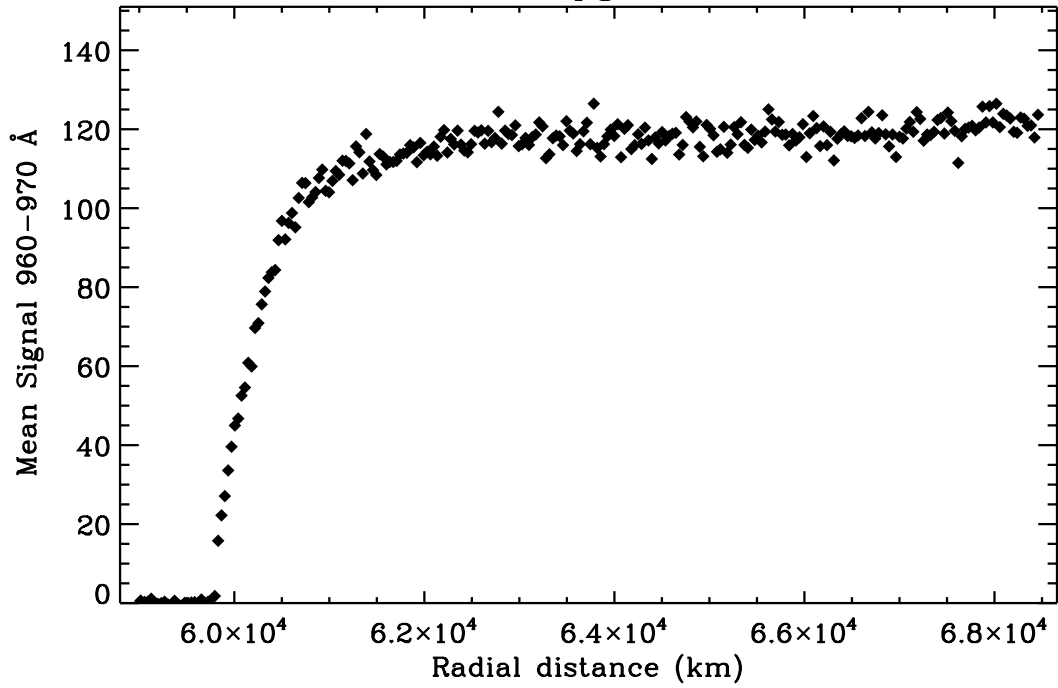
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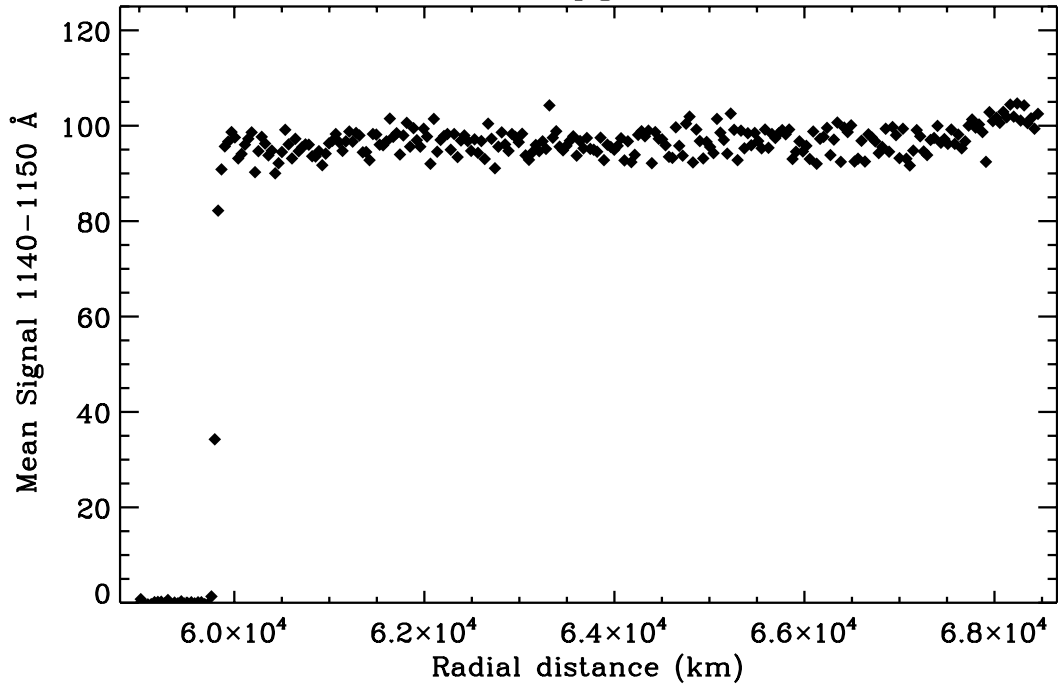
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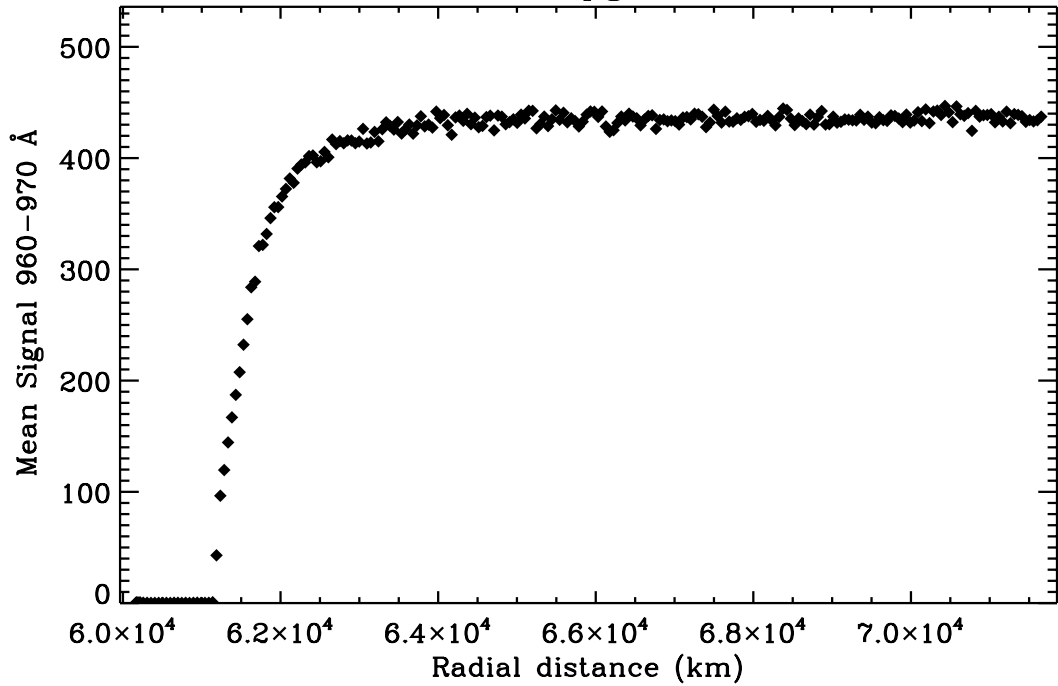
ϵ Ori Jan 14, 2016 pgLat: 30° LST: 19:10



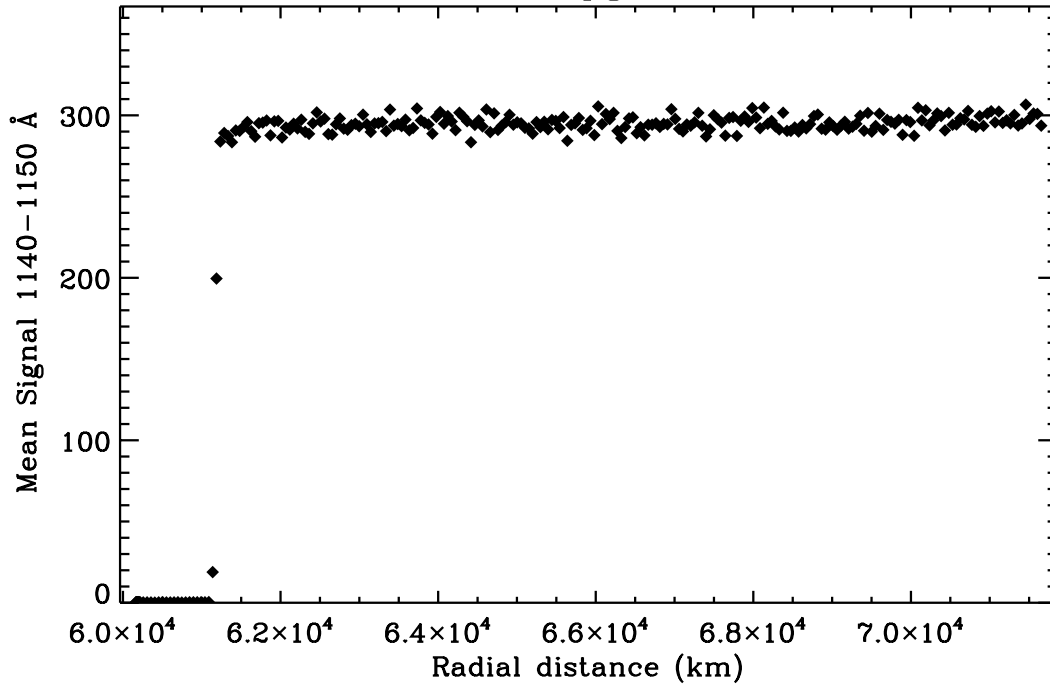
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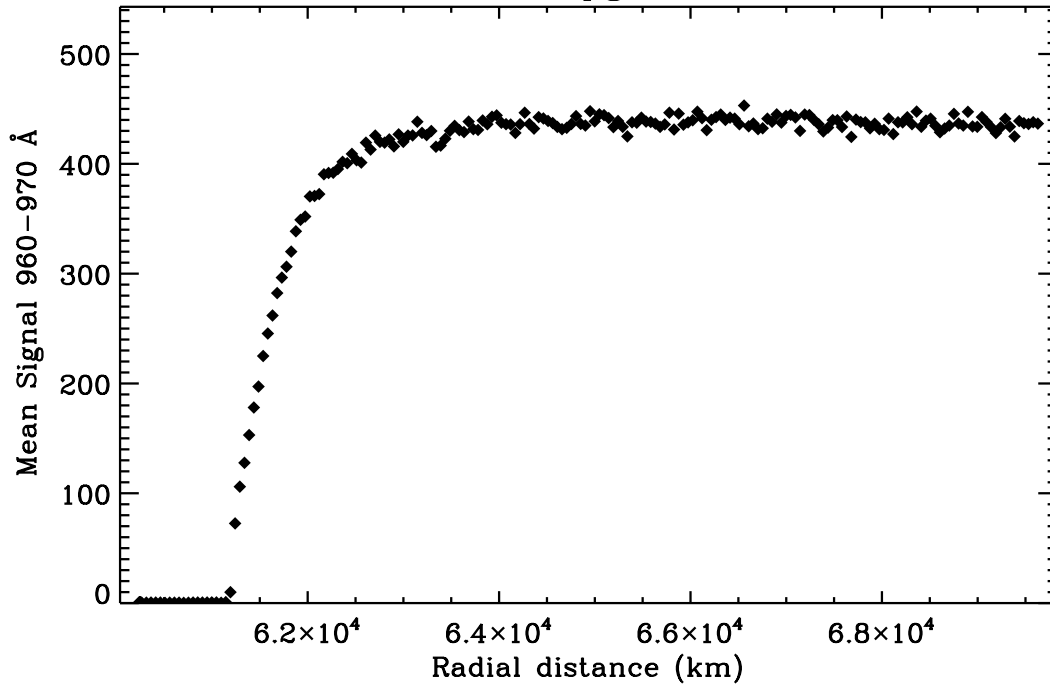
α Vir Feb 14, 2016 pgLat: 5.4° LST: 2:38



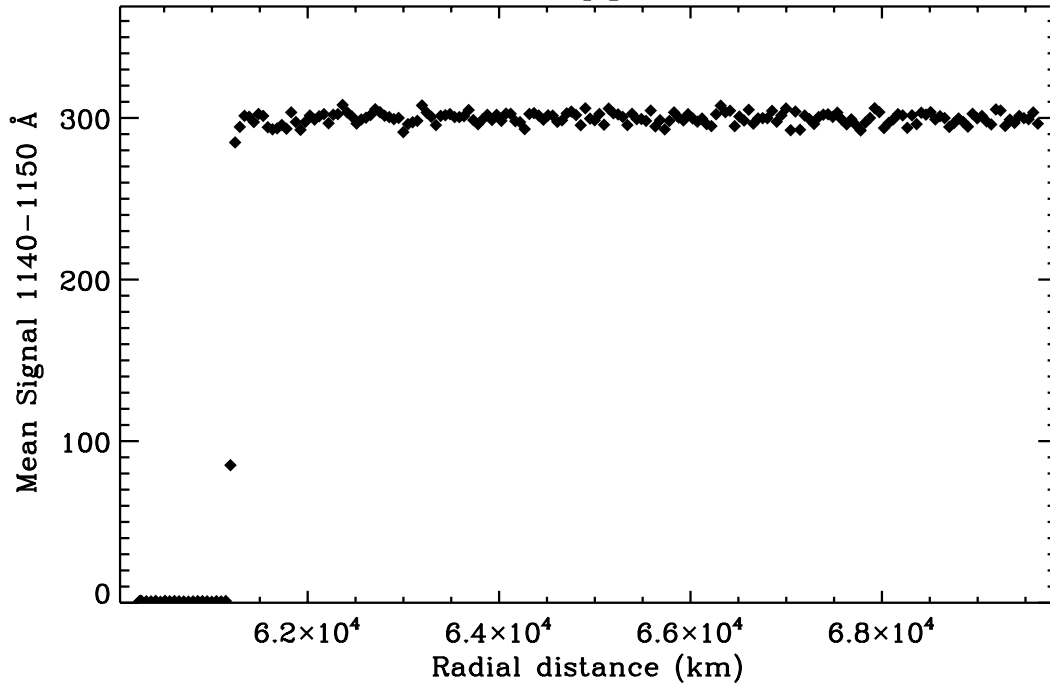
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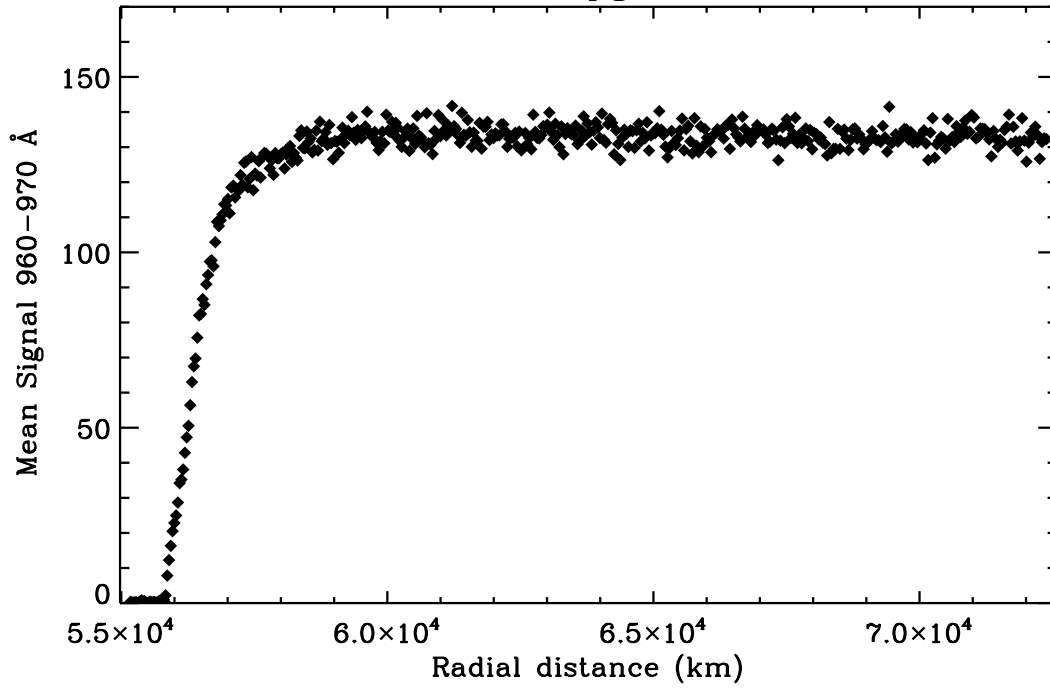
α Vir Feb 14, 2016 pgLat: 1.5° LST: 8:50



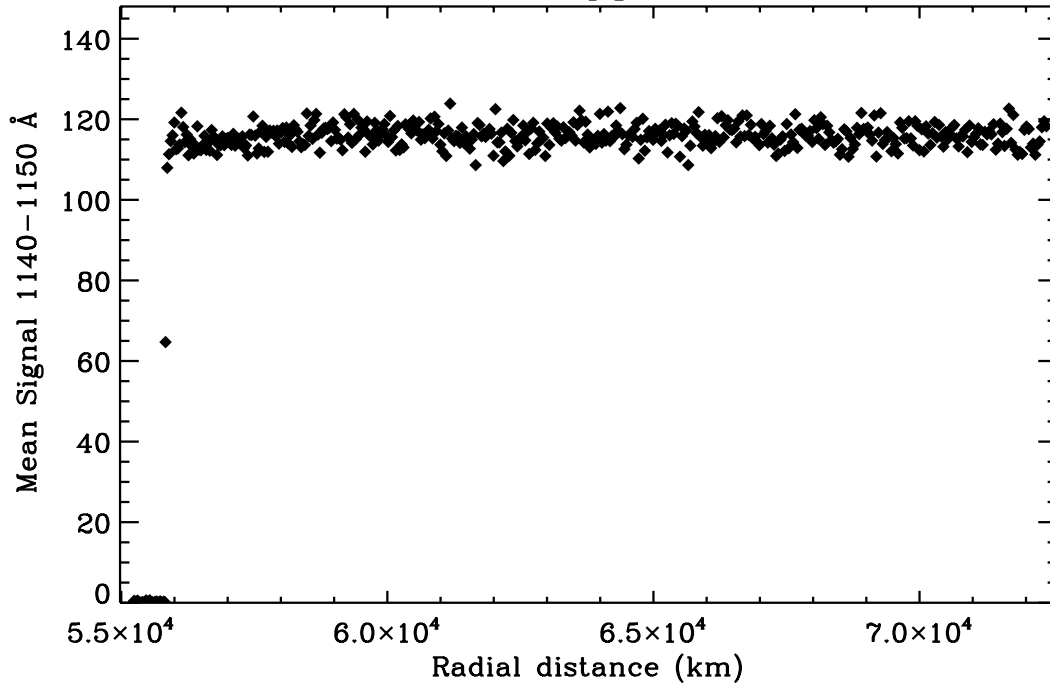
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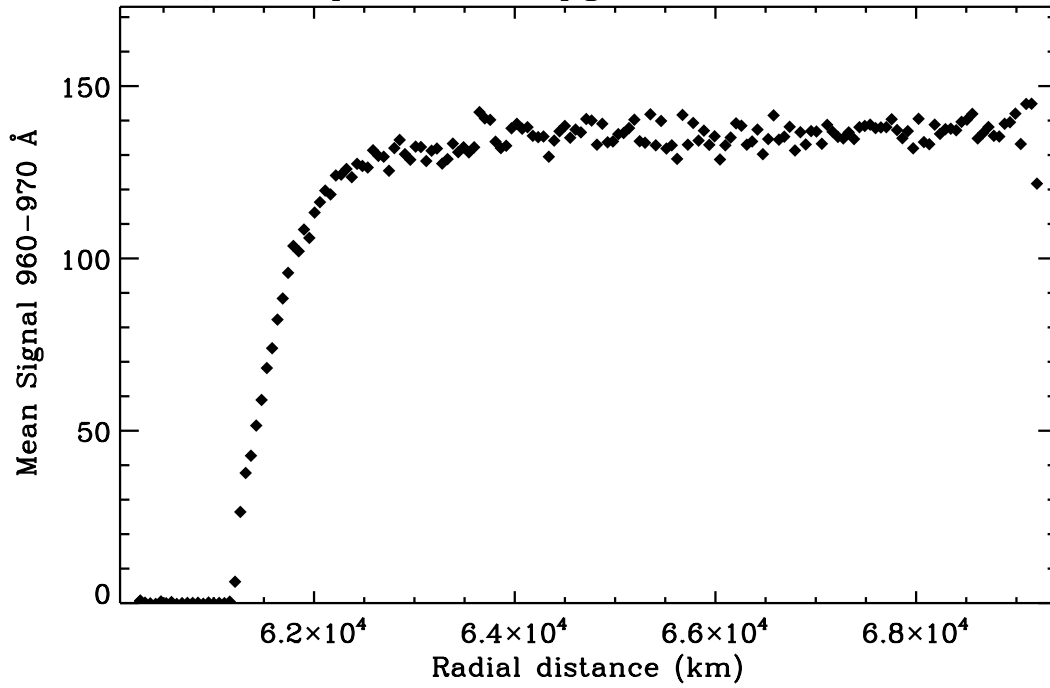
γ Ori Feb 15, 2016 pgLat: 70° LST: 4:39



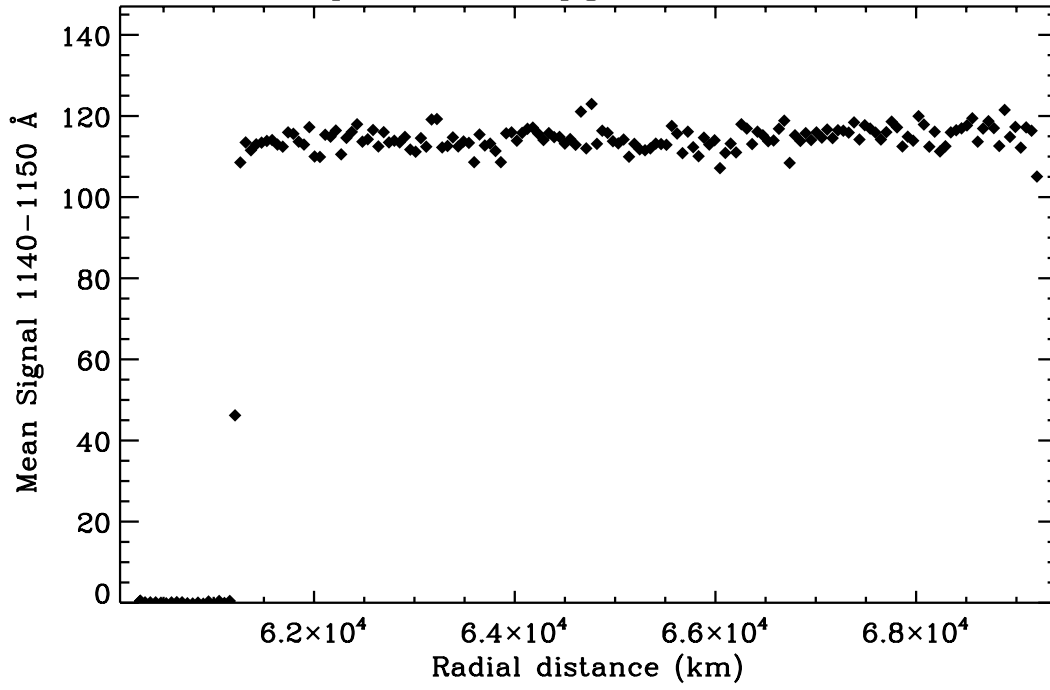
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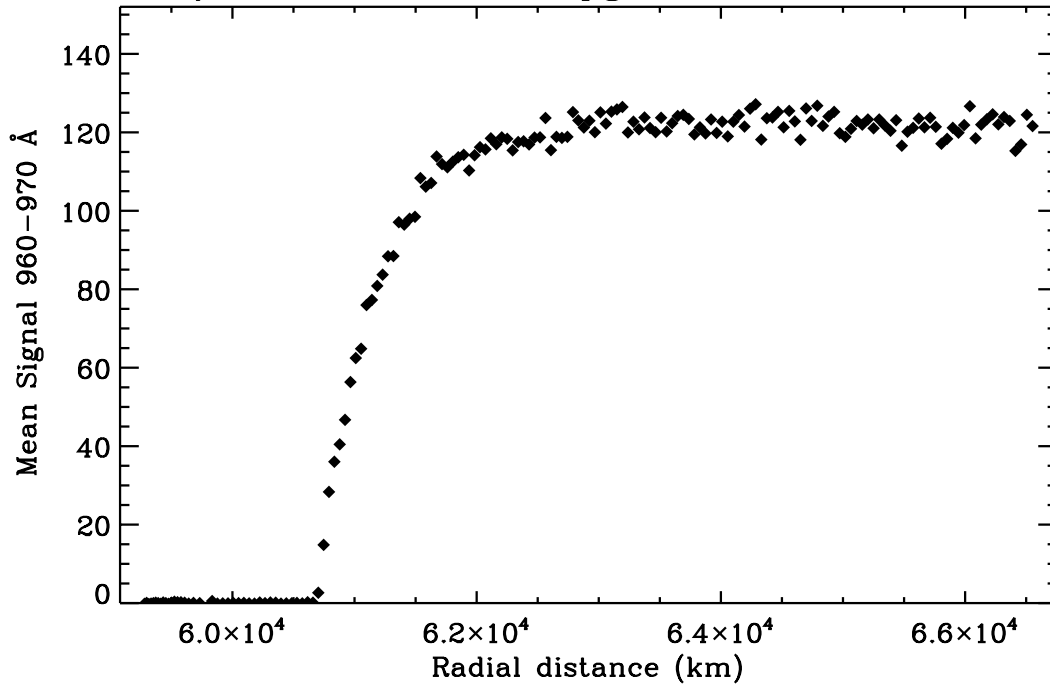
γ Ori Apr 3, 2016 pgLat: 0.6° LST: 18:43



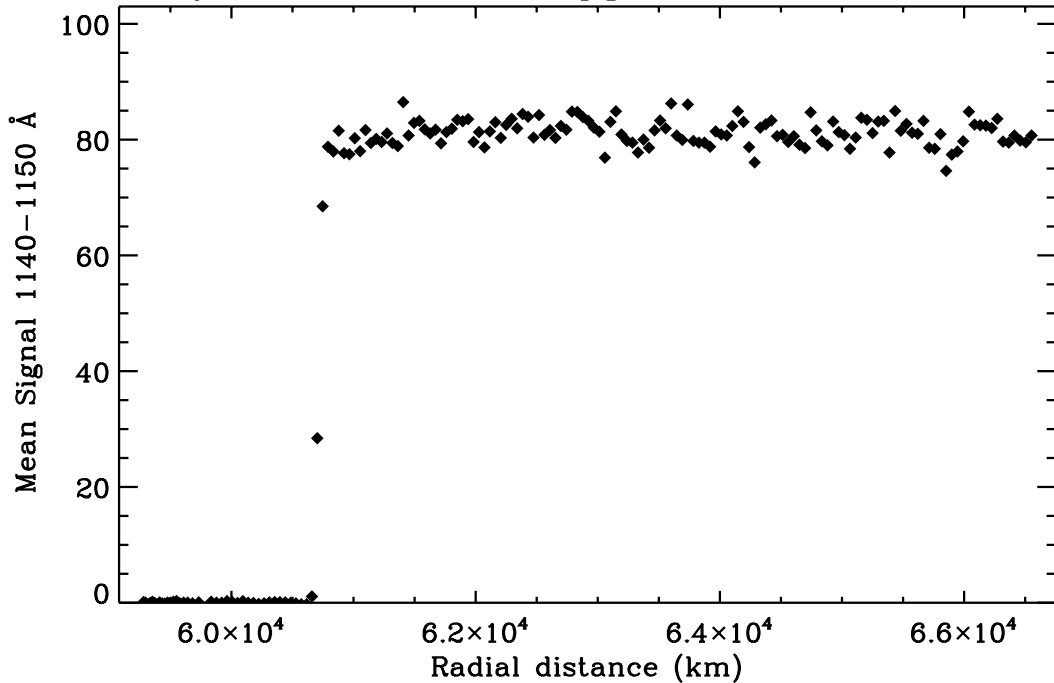
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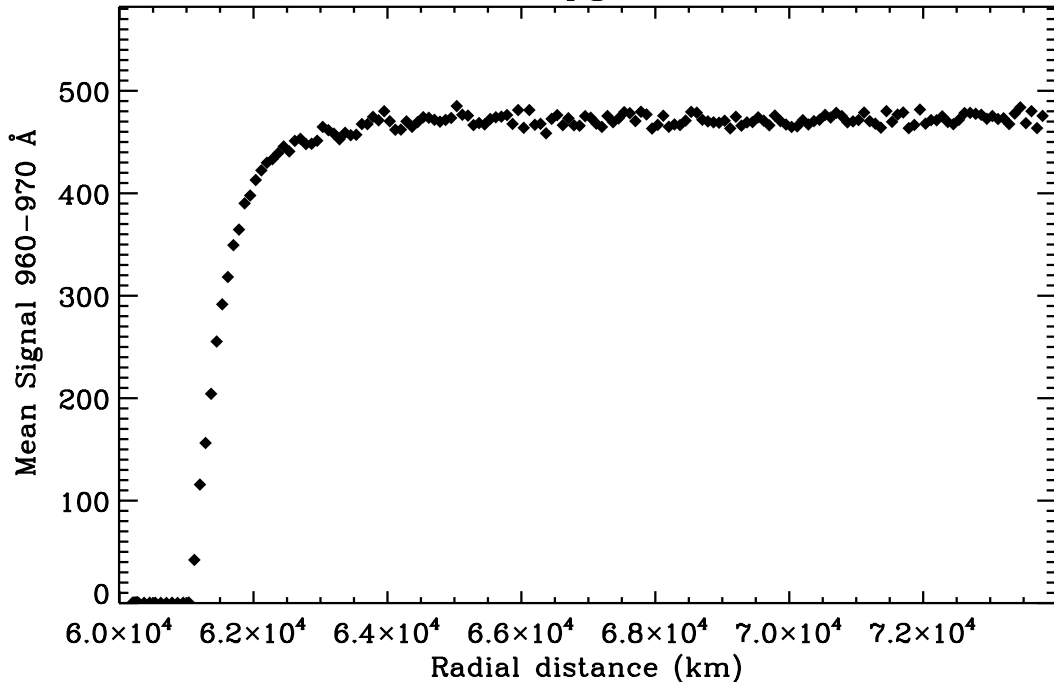
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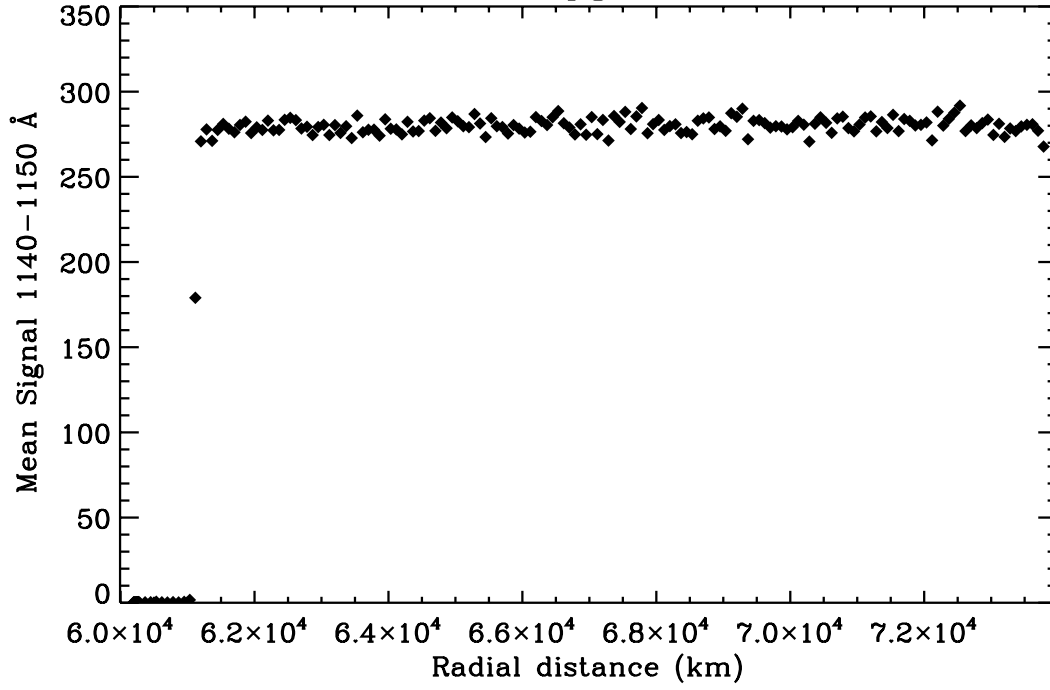
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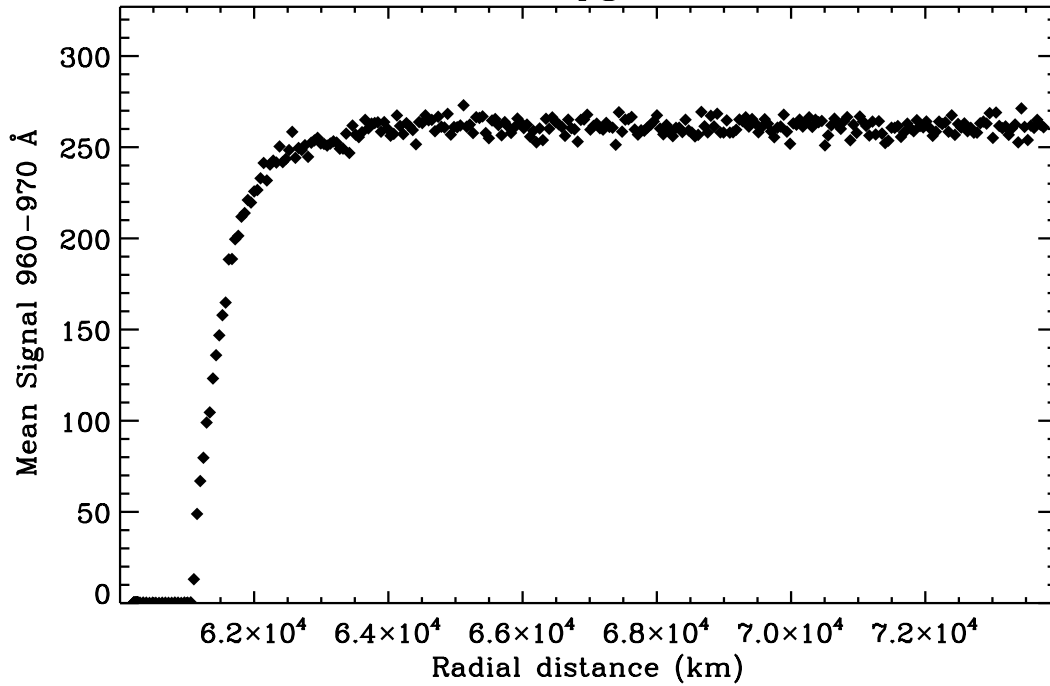
β CRU Dec 4, 2016 pgLat: -7.6° LST: 2:11



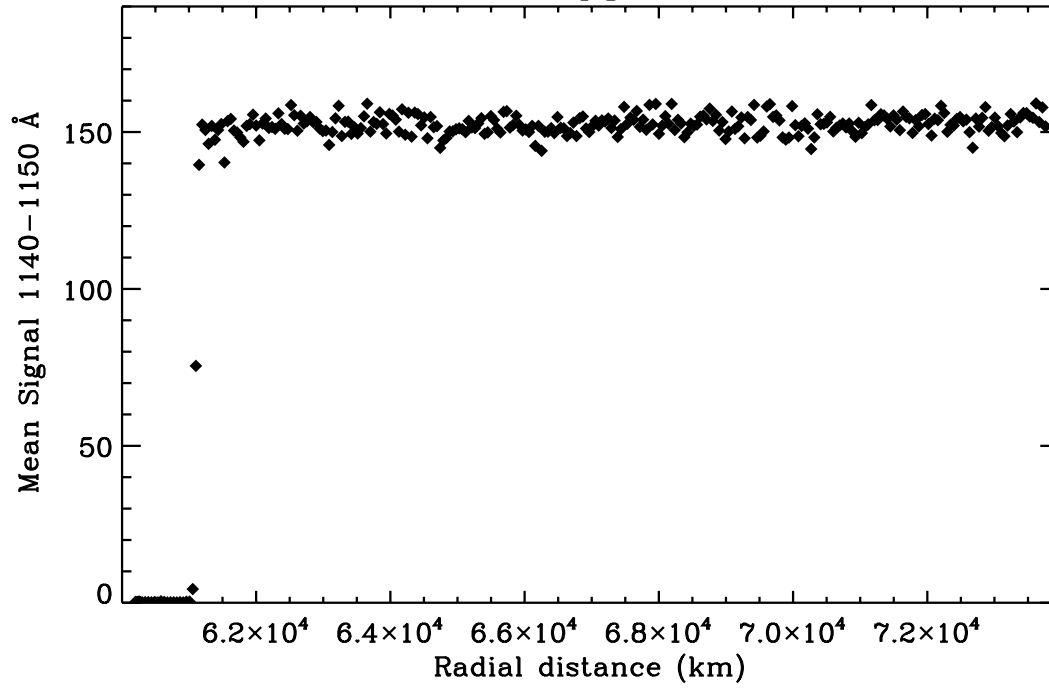
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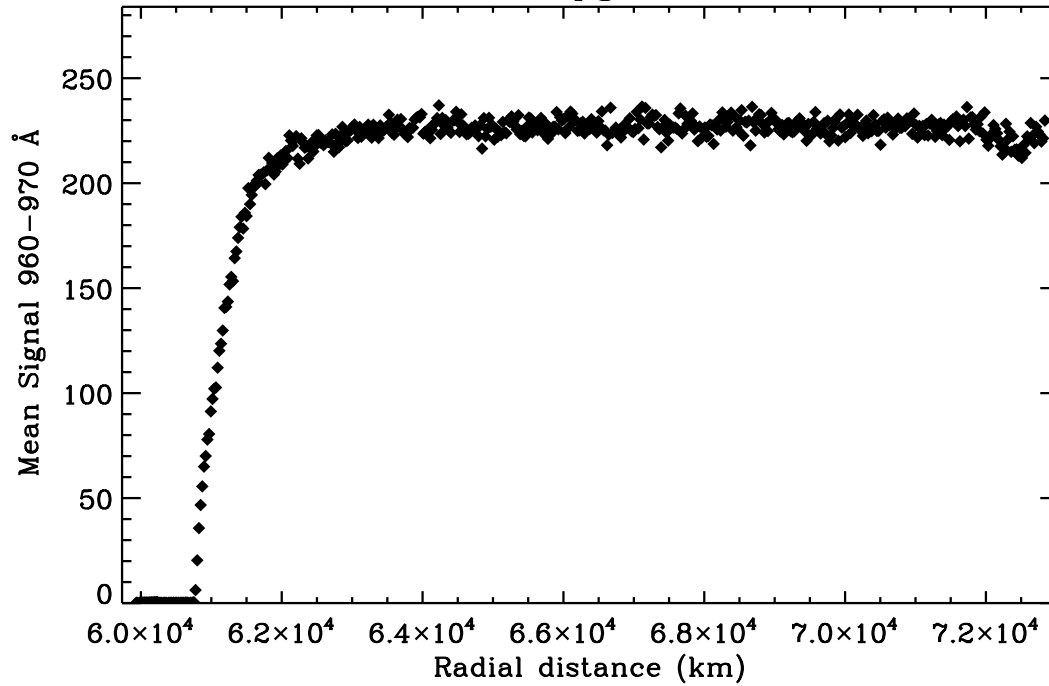
β CRU Dec 18, 2016 pgLat: -7.4° LST: 2:07



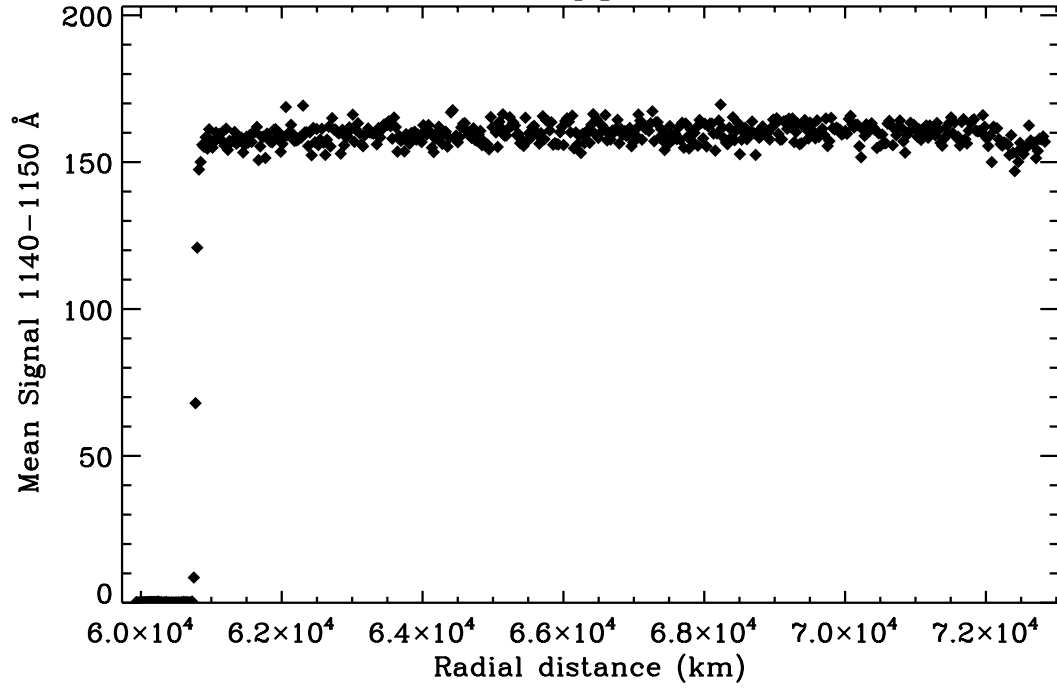
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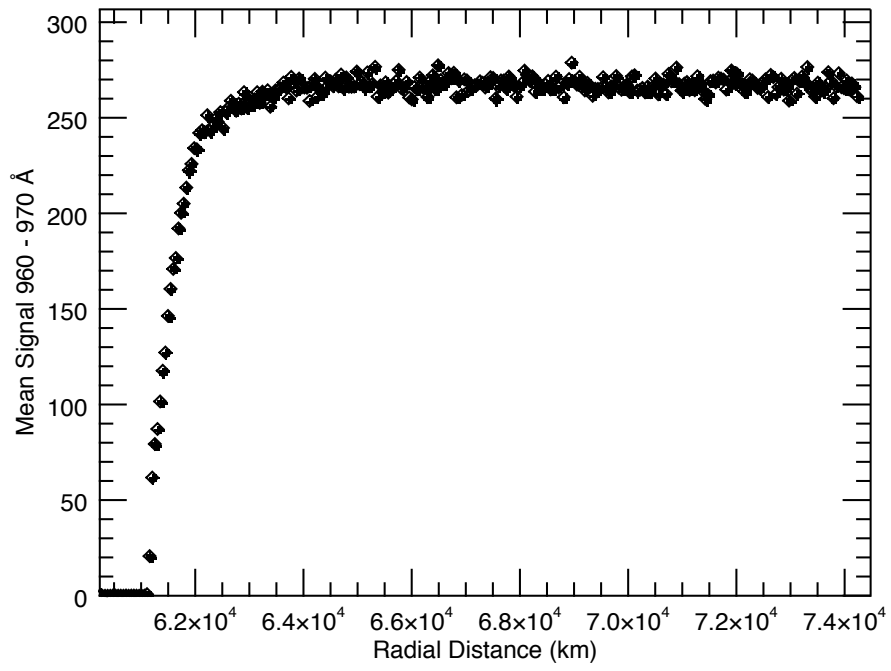
α CRU Jan 9, 2017 pgLat: -16° LST: 3:30



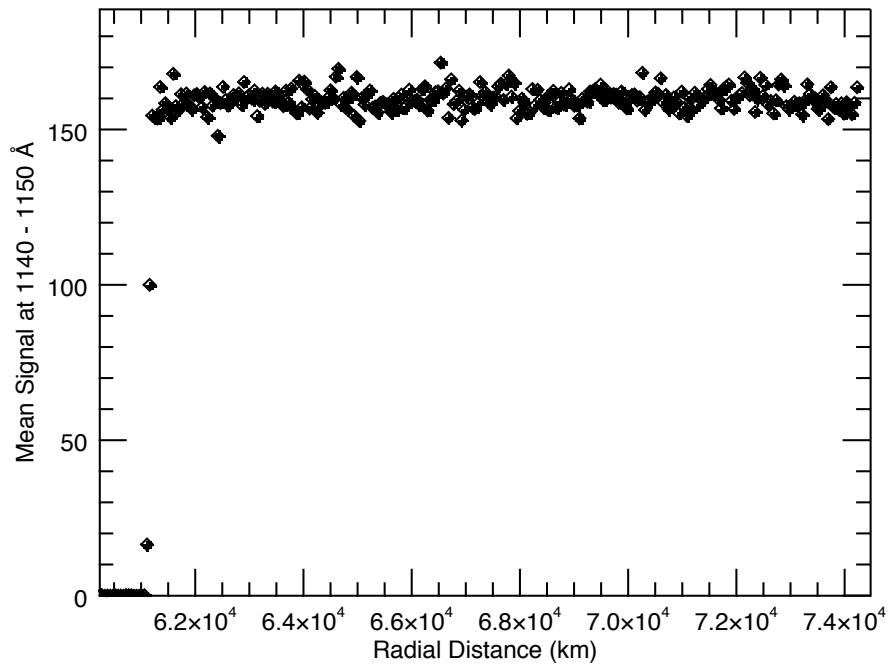
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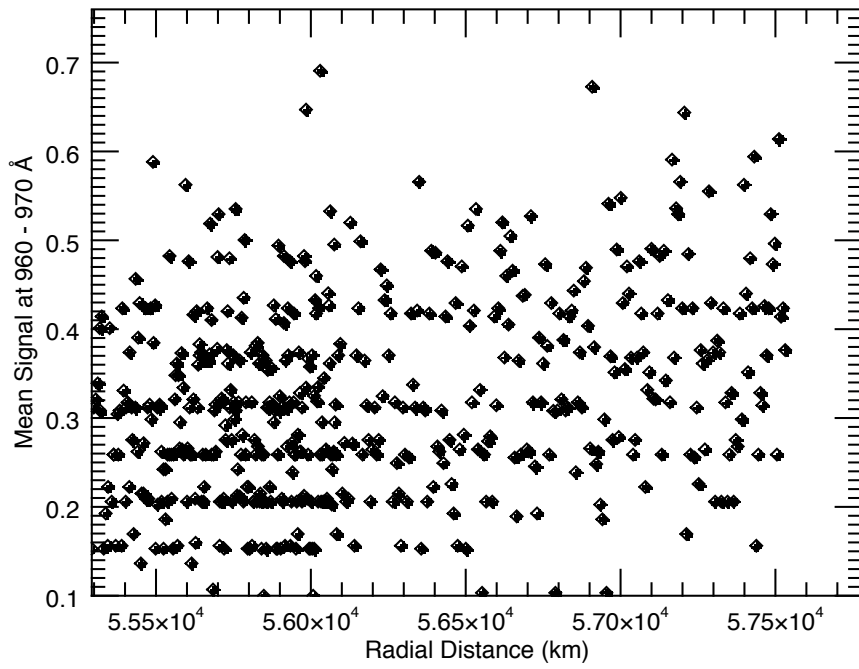
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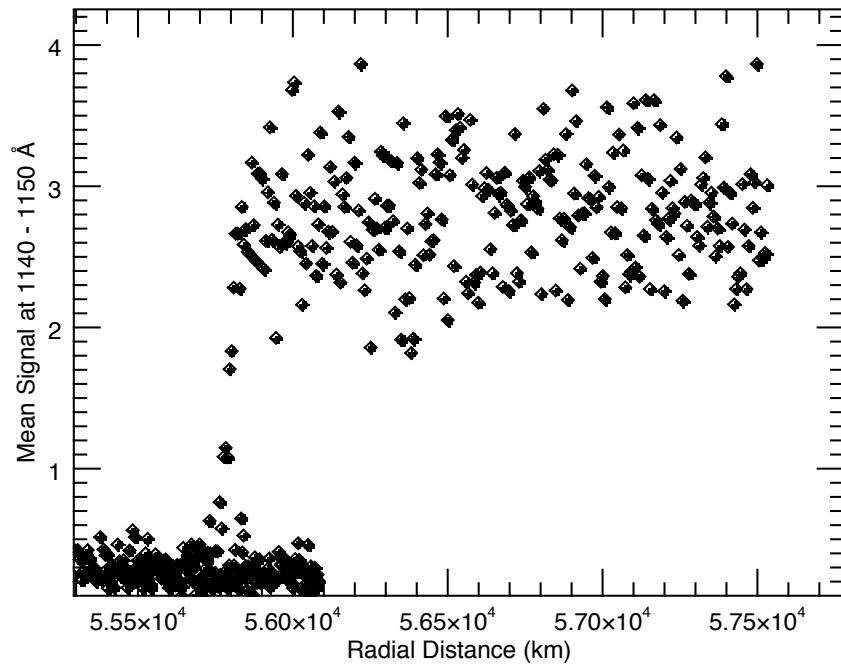
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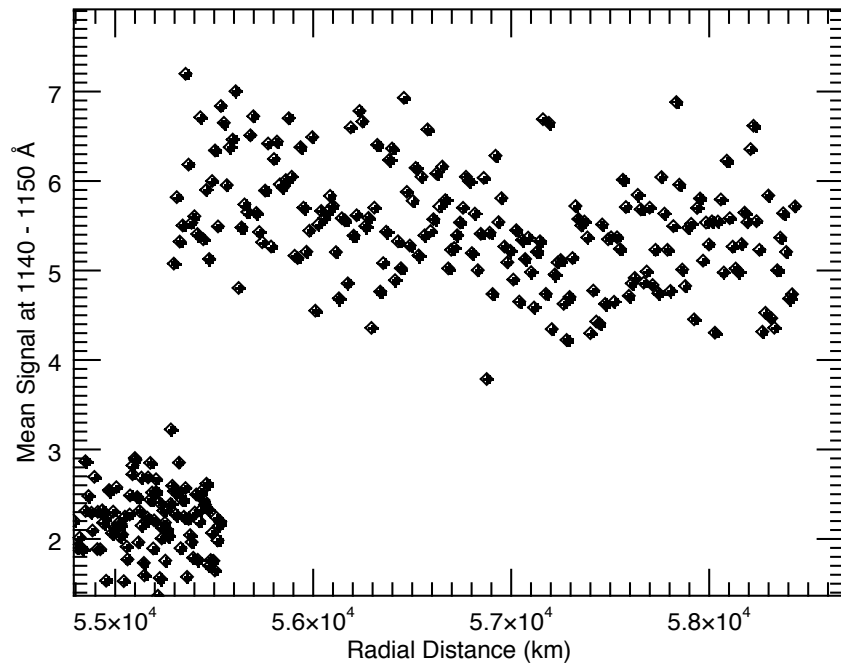
α CMa May 19, 2017 pgLat: -60.6° LST: 4:07



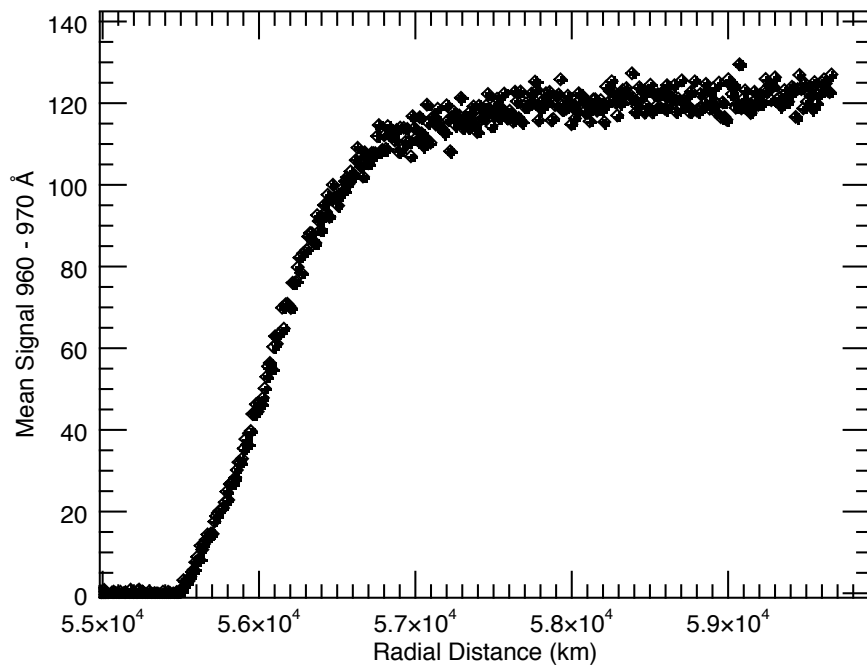
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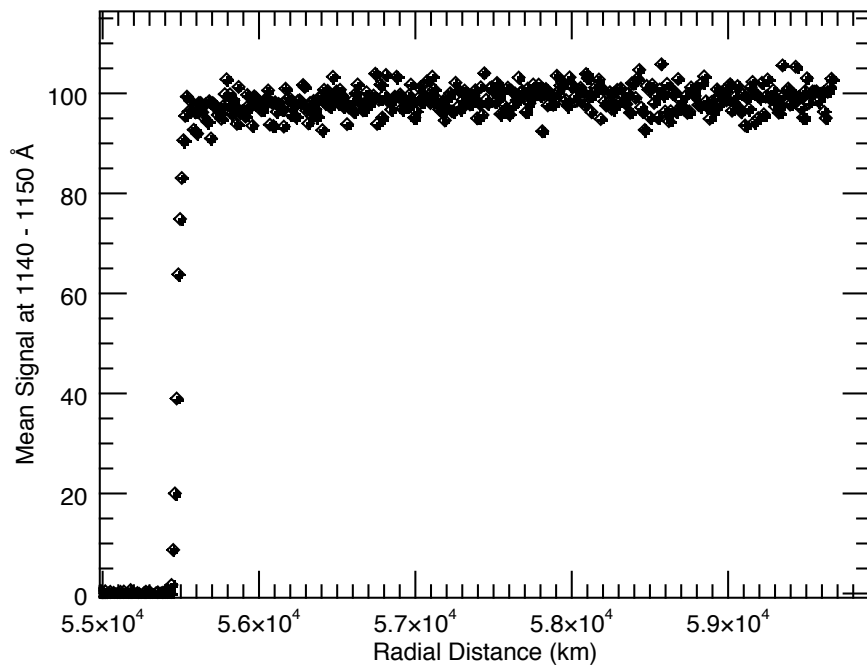
α CMa May 26, 2017 pgLat: -66.4° LST: 23:52



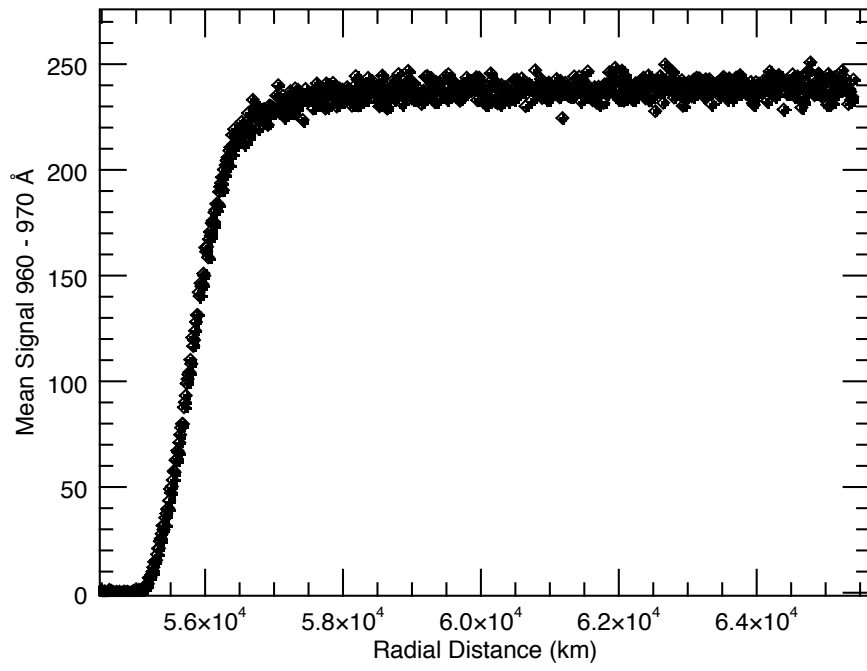
ϵ ORI Jun 24, 2017 pgLat: -72.9° LST: 6:55



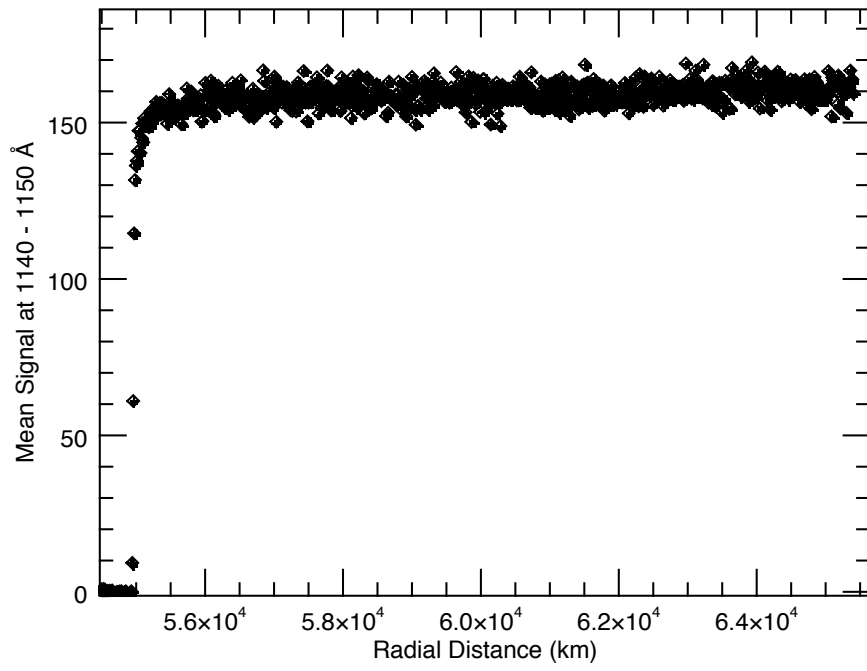
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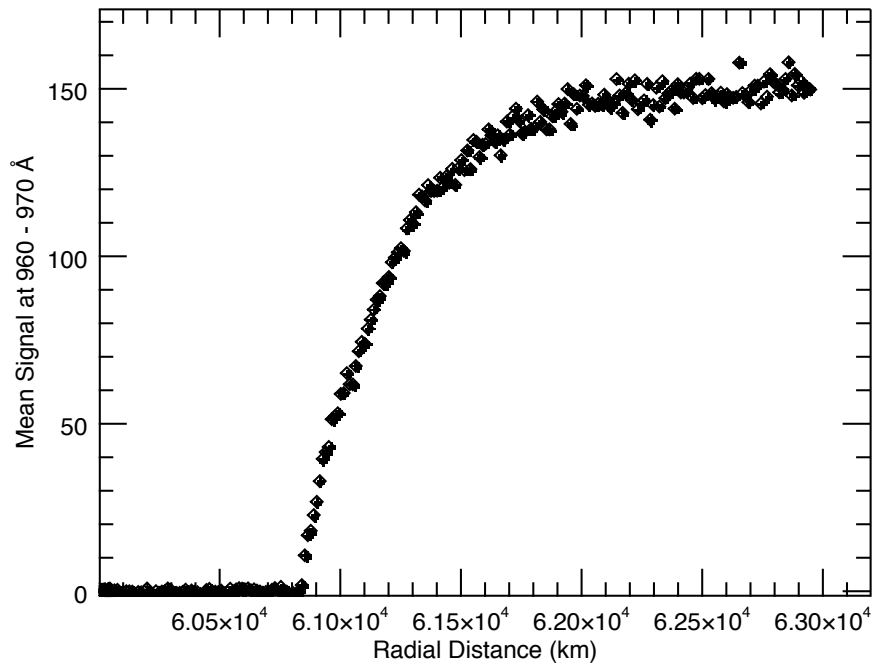
ζ ORI Jun 24, 2017 pgLat: -80.9° LST: 11:05



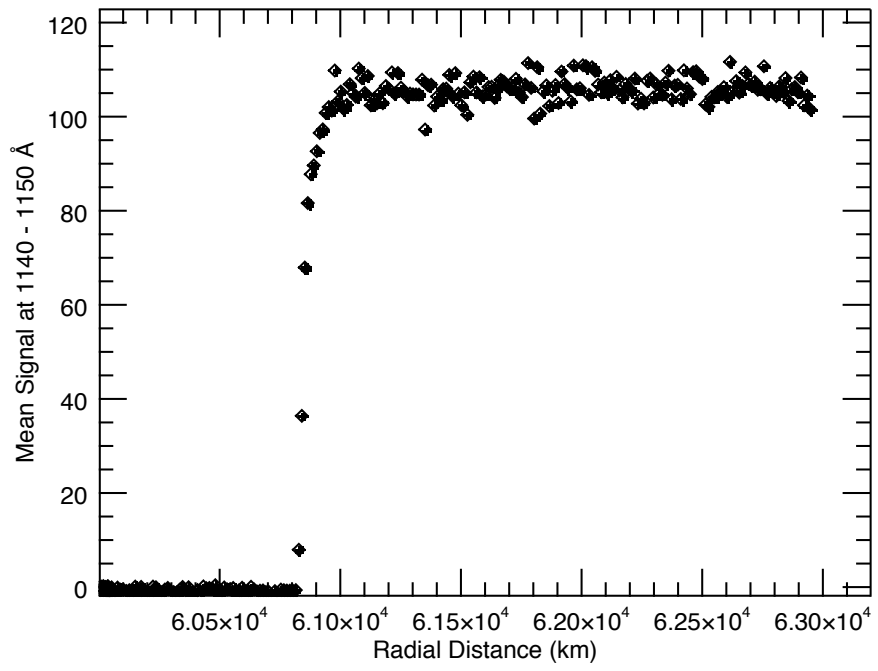
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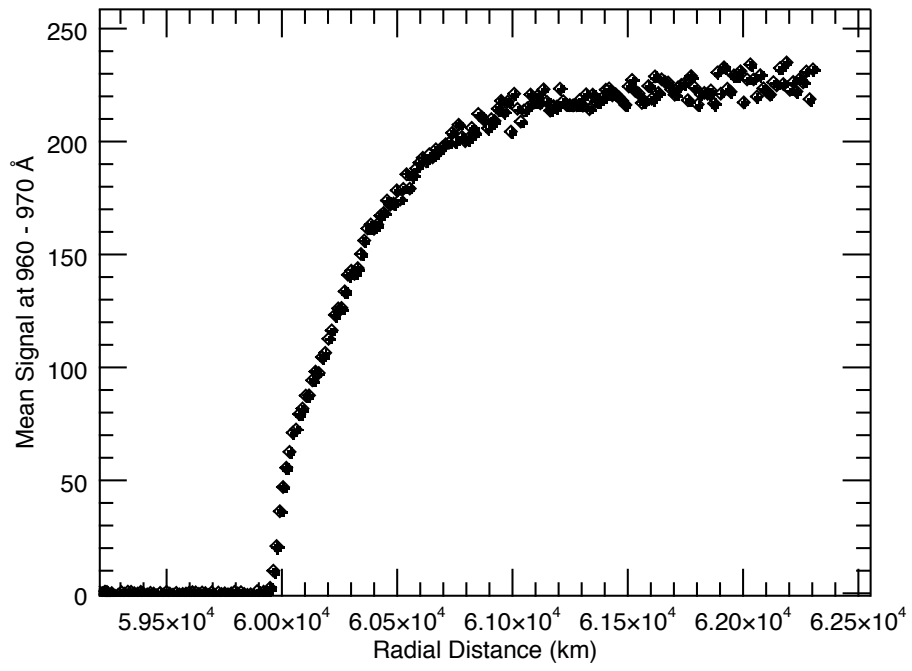
ϵ ORI Jun 25, 2017 pgLat: 12.7° LST: 5:19



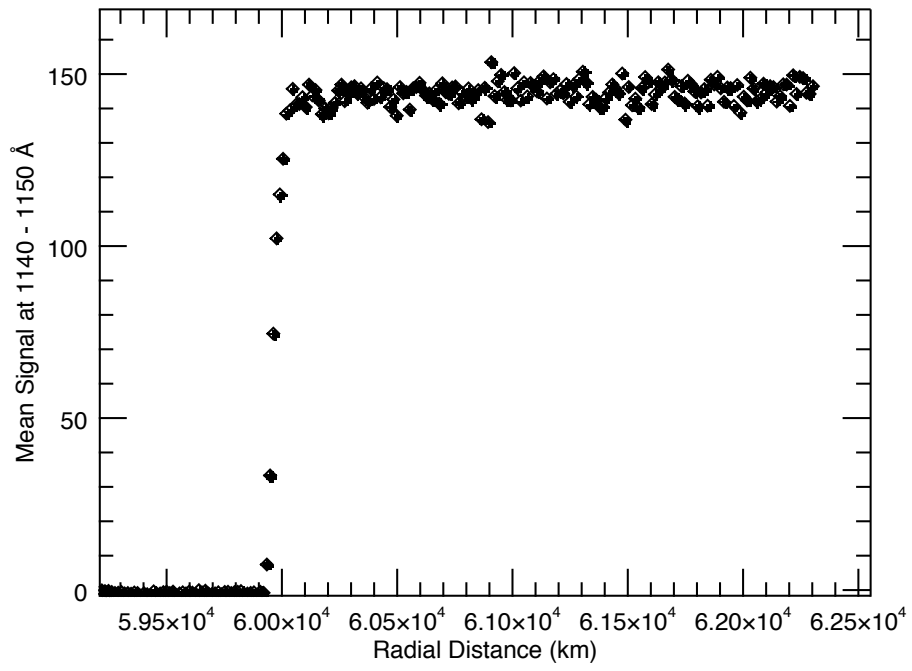
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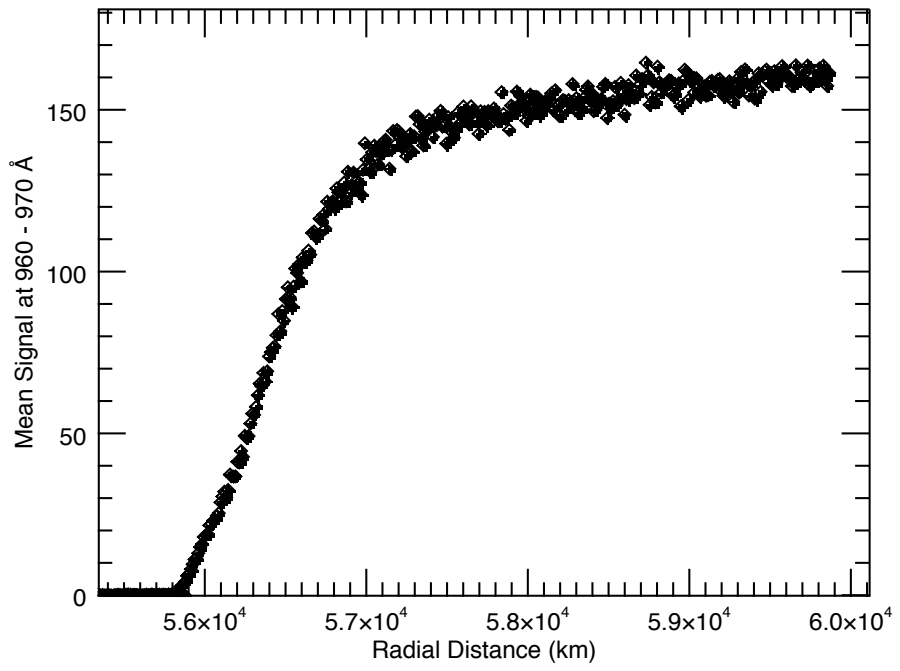
ζ ORI Jun 25, 2017 pgLat: 27.5° LST: 5:30



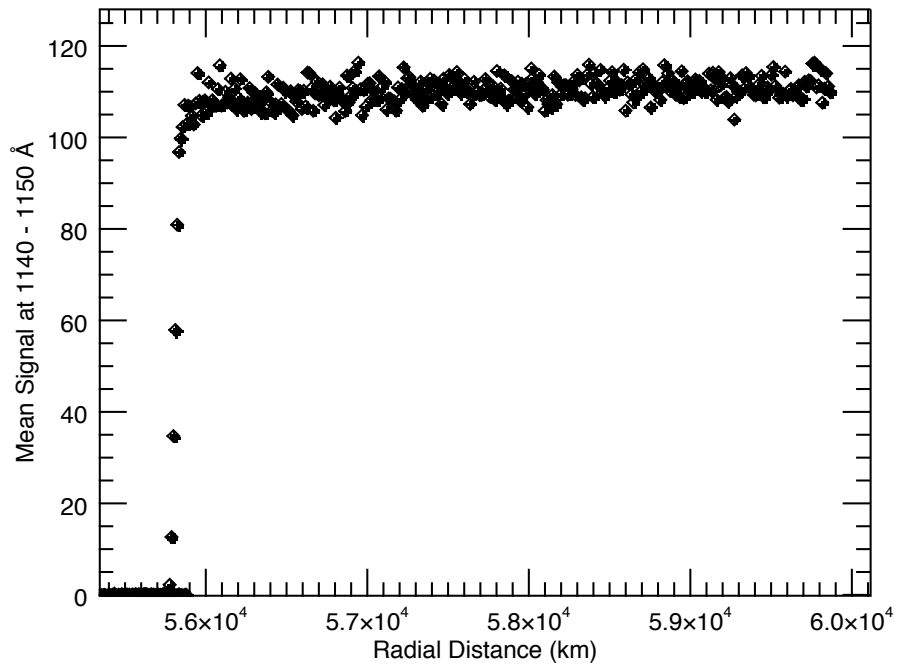
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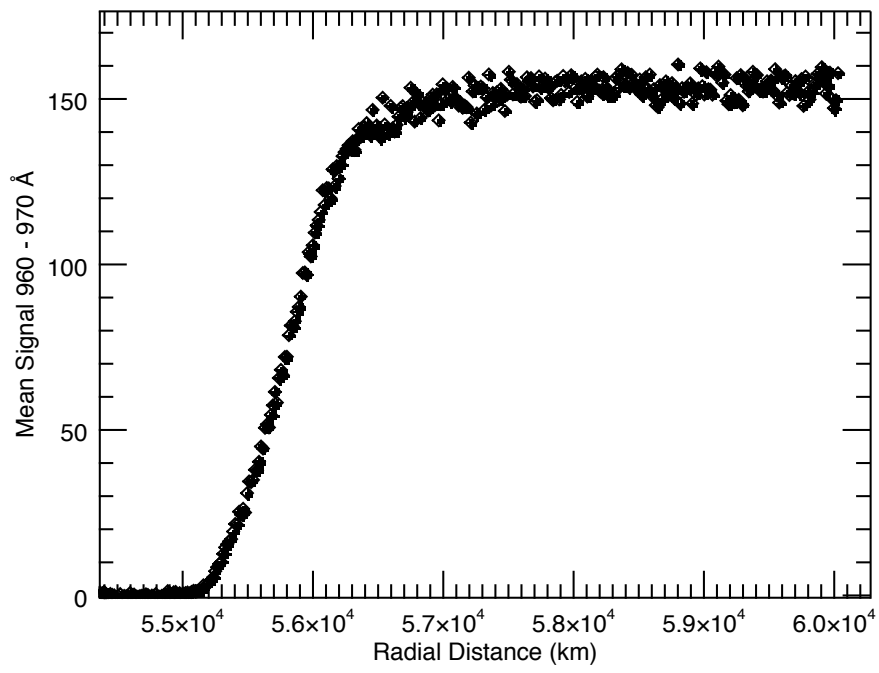
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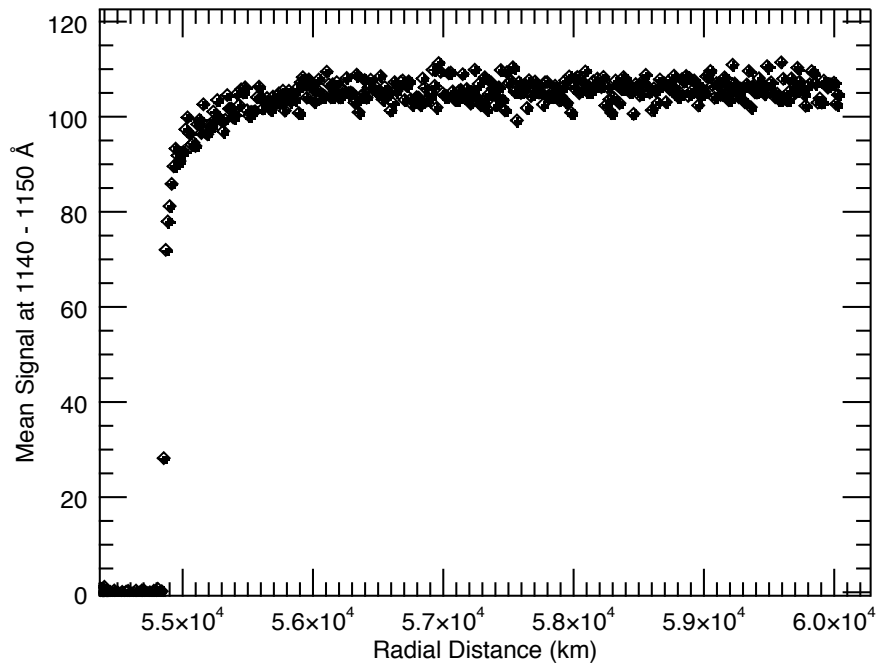
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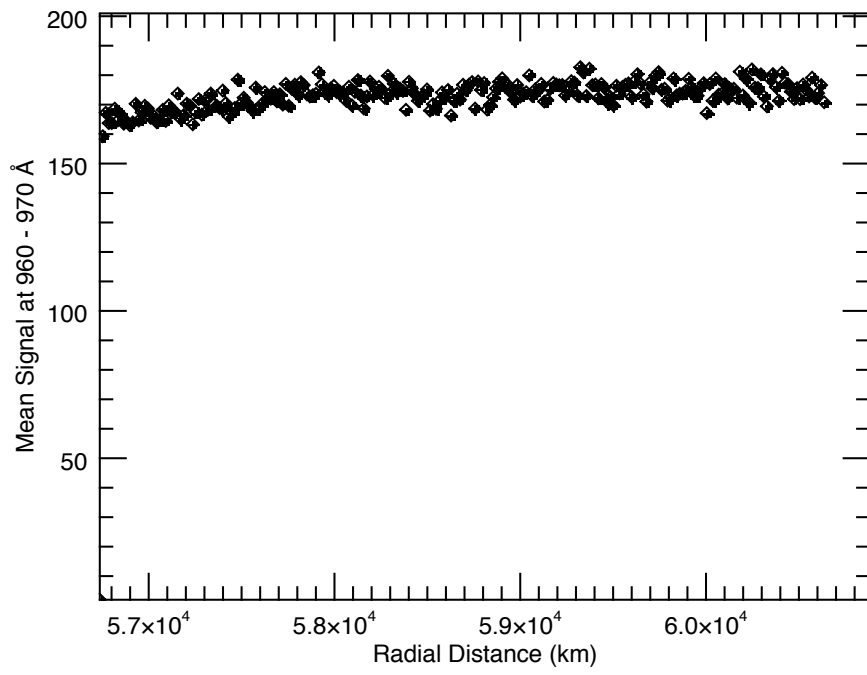
ϵ ORI Jul 1, 2017 pgLat: -85.3° LST: 14:31



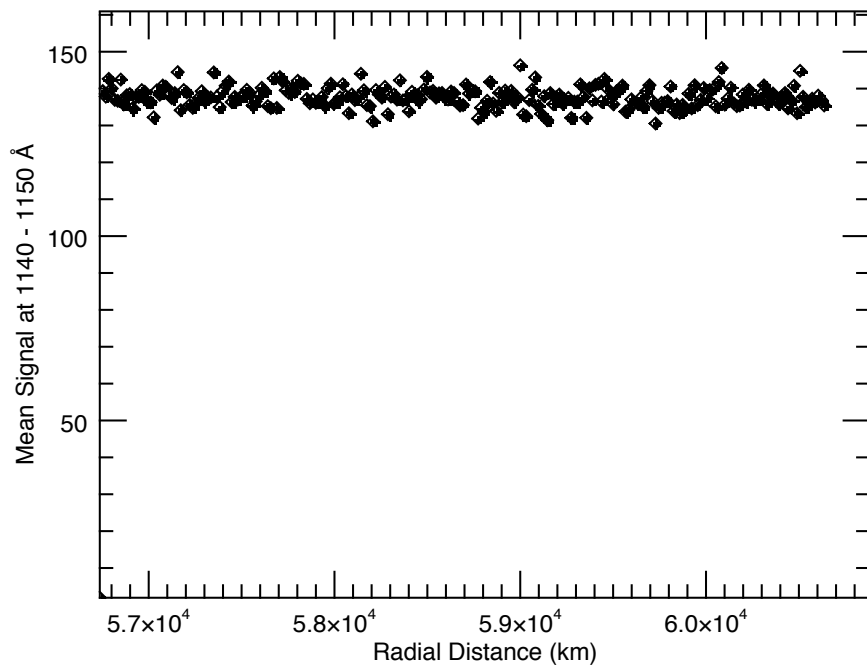
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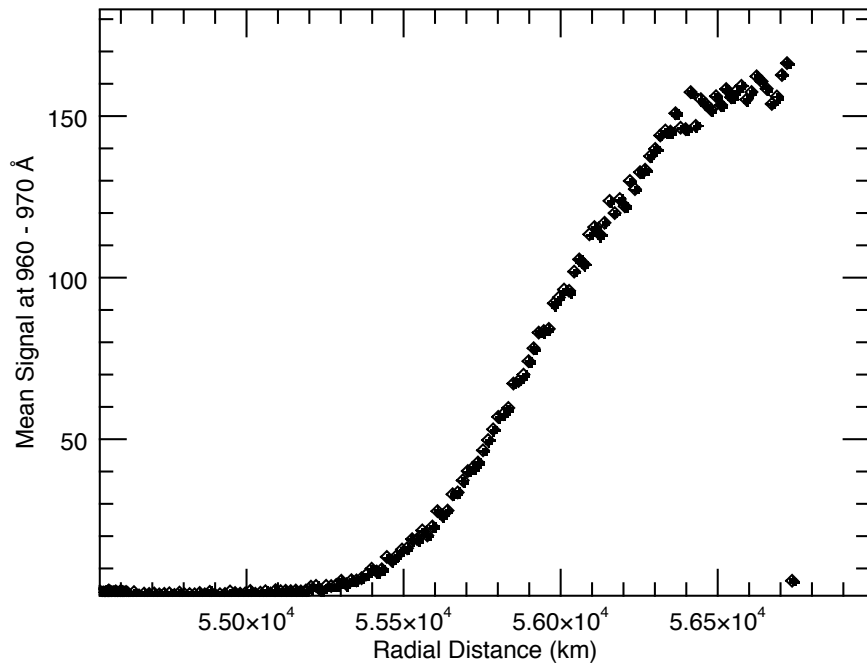
ζ ORI Jul 1, 2017 pgLat: -80.3° LST: 16:58



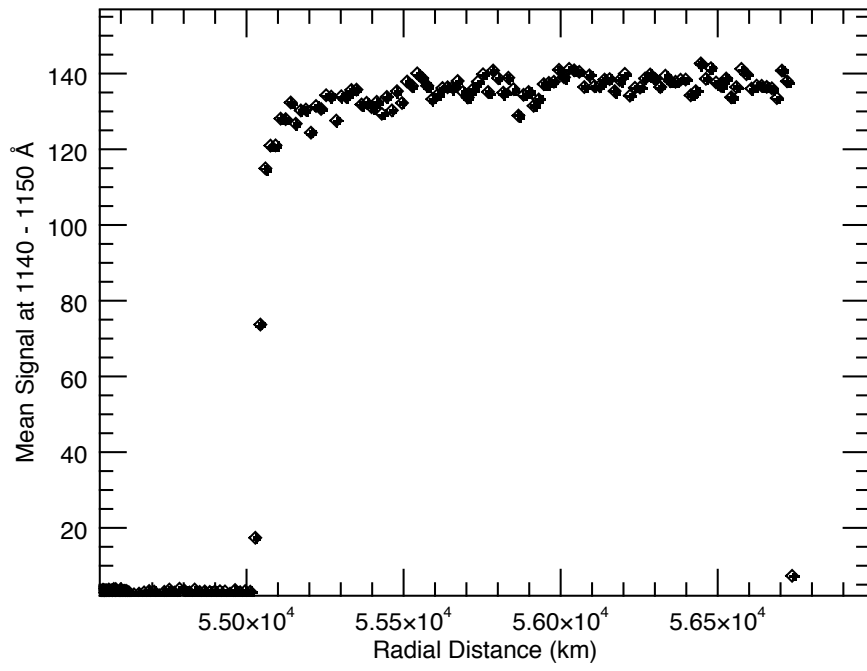
ξ ORI Jul 1, 2017 pgLat: -79.2° LST: 16:52
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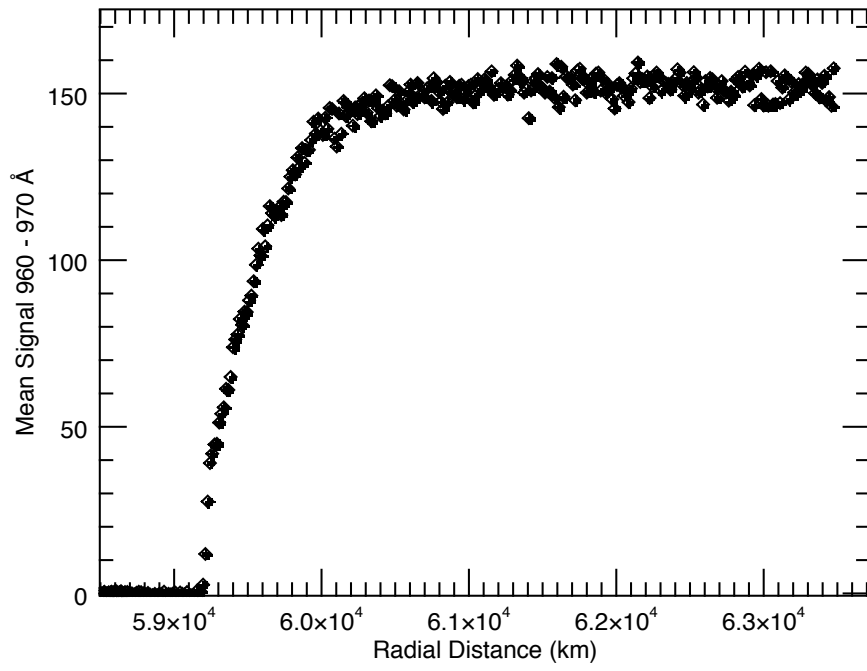
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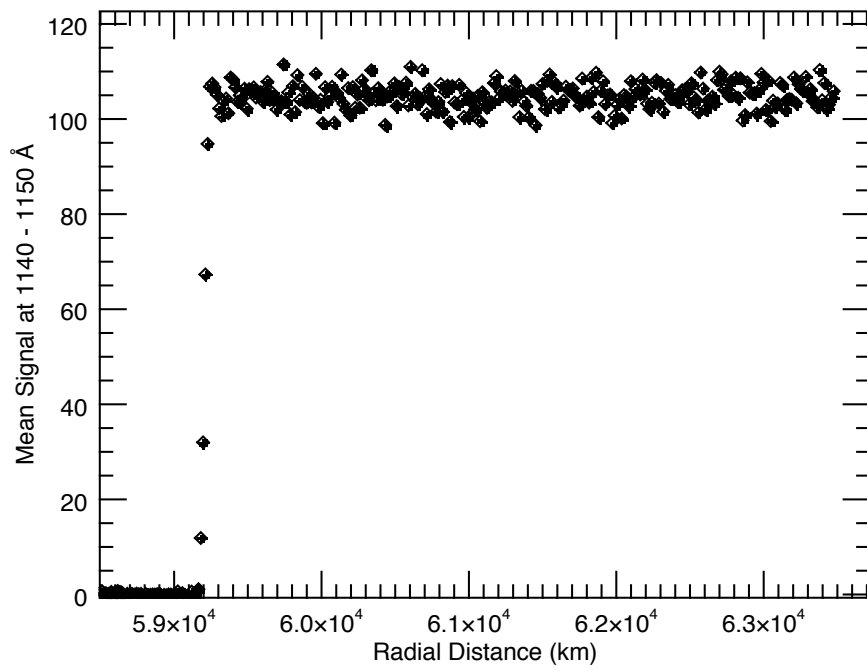
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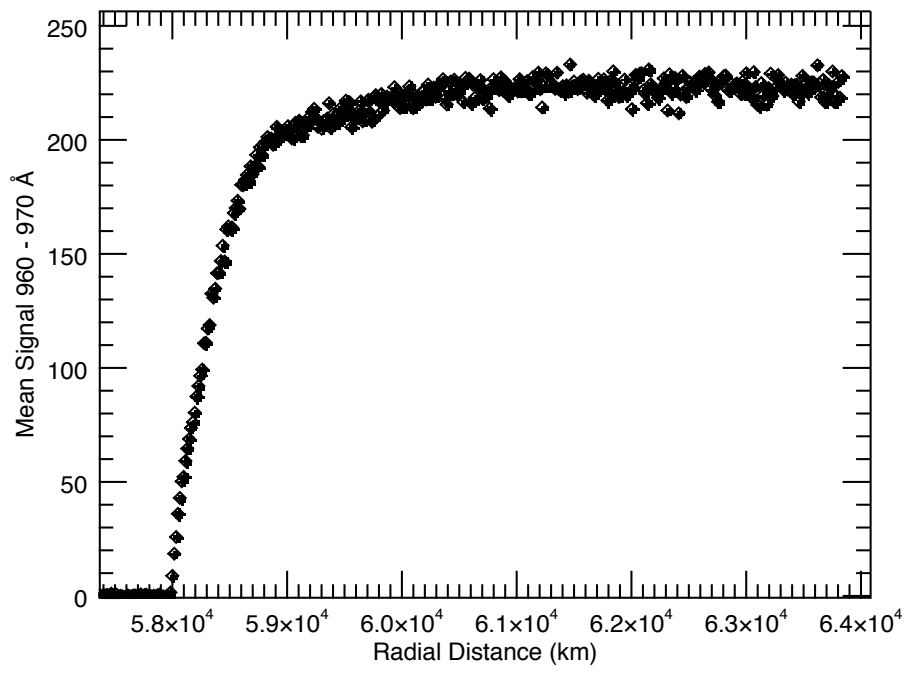
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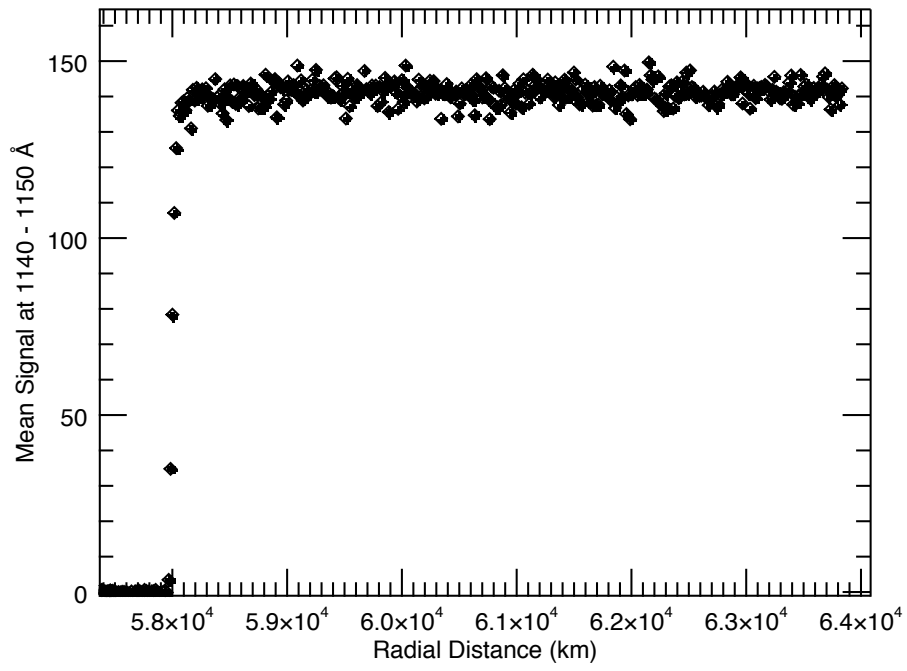
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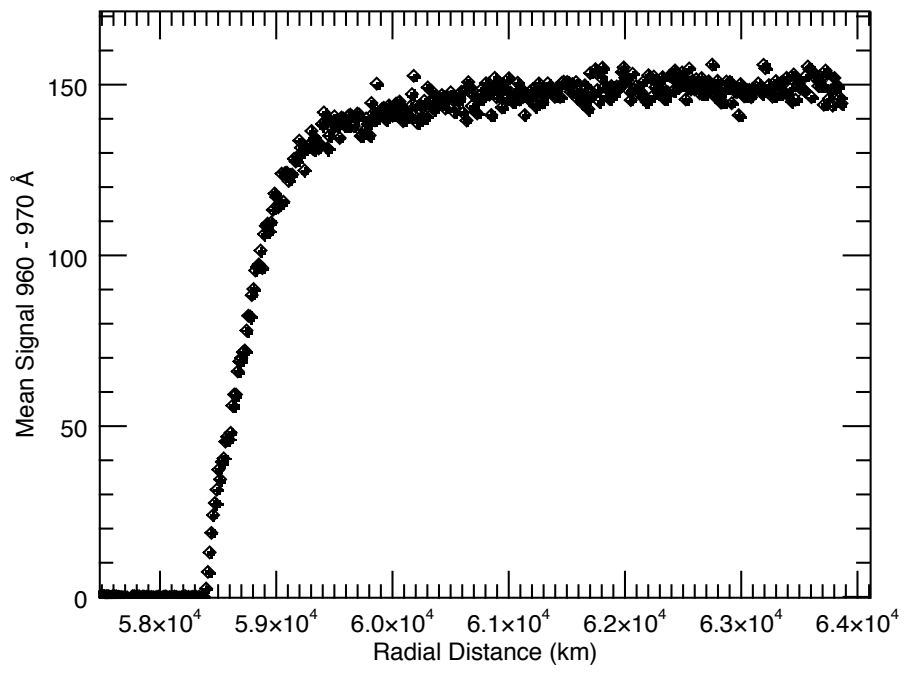
ζ ORI Jul 2, 2017 pgLat: 47.1° LST: 5:01



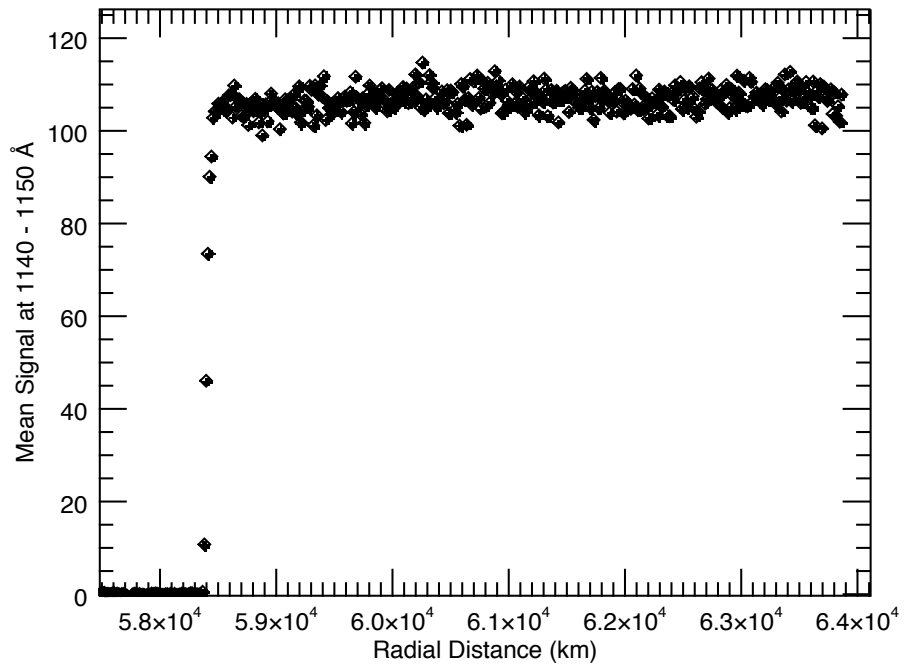
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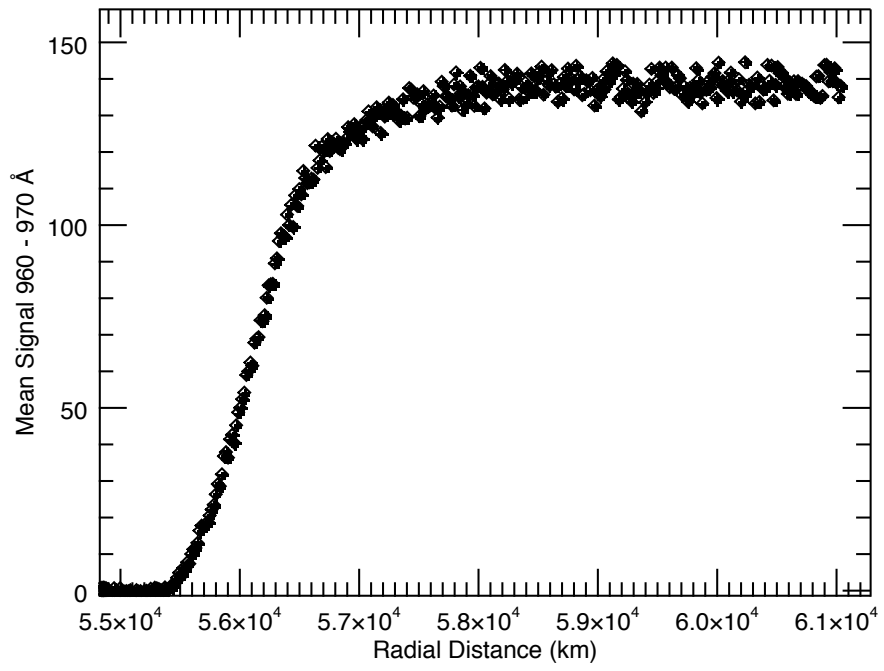
β CMA Jul 4, 2017 pgLat: 47.1° LST: 6:25



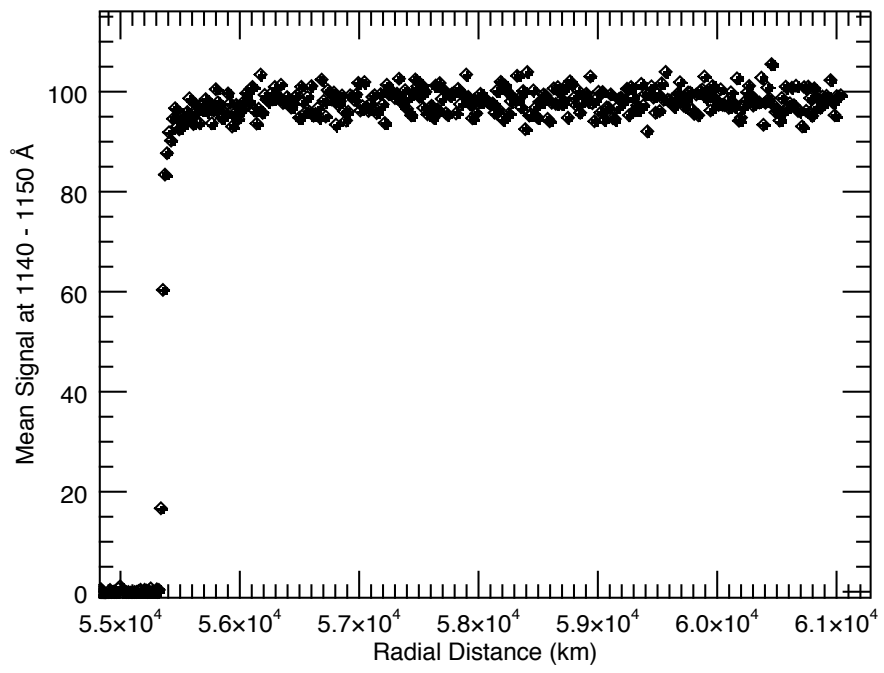
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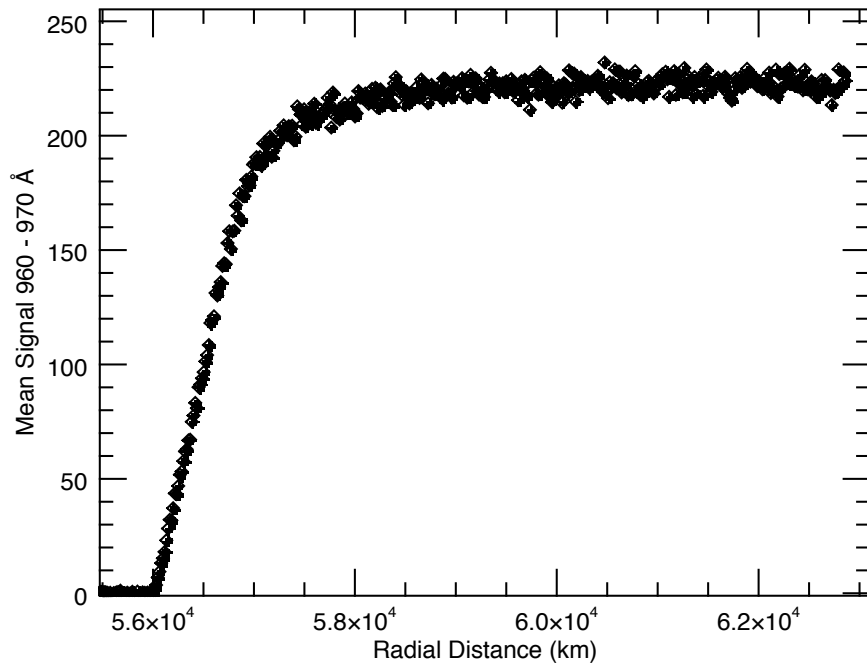
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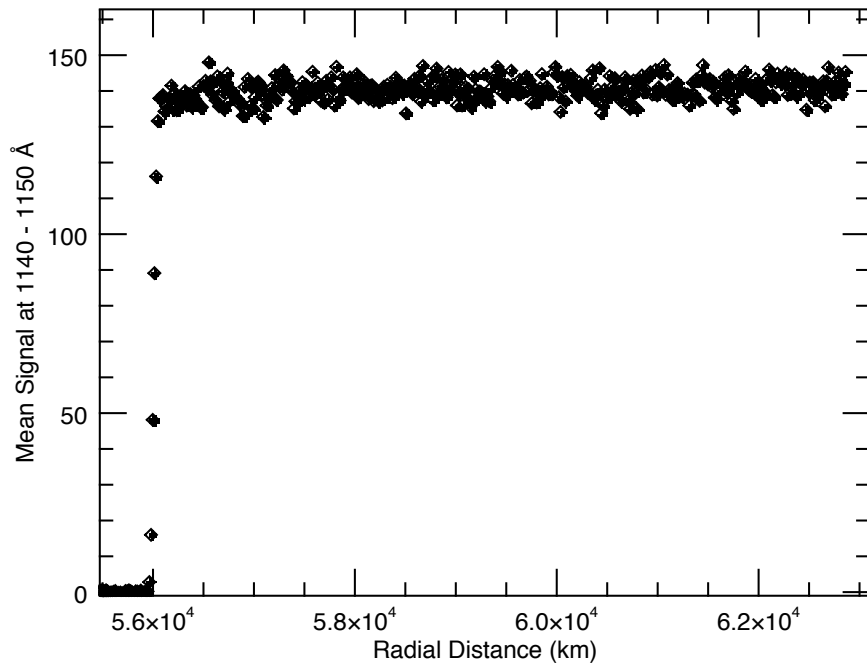
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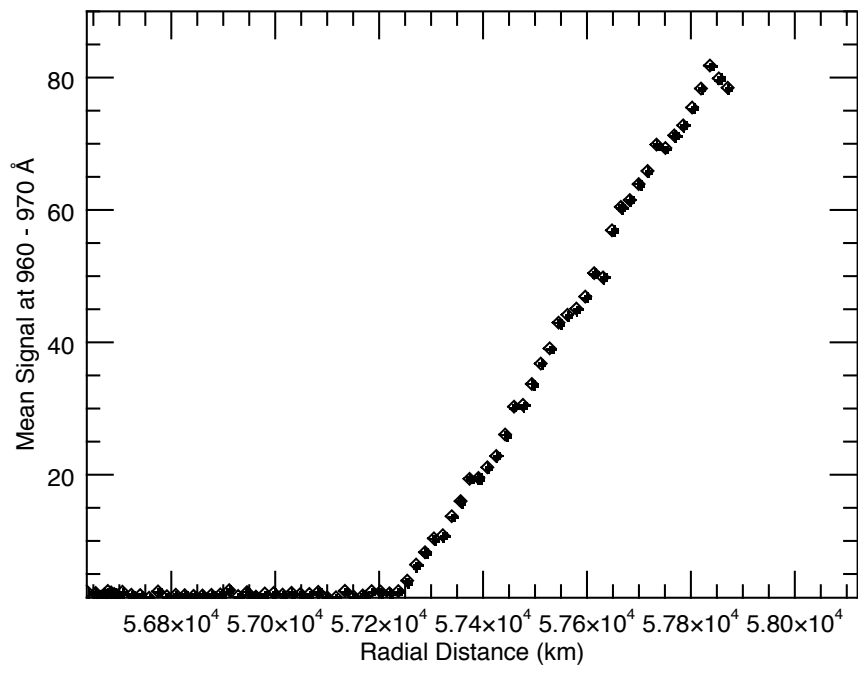
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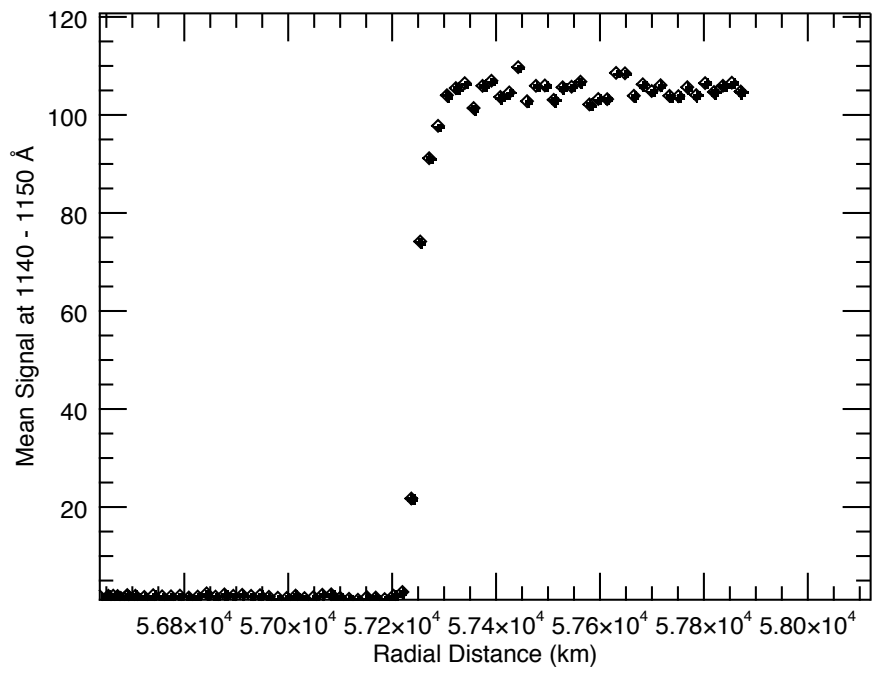
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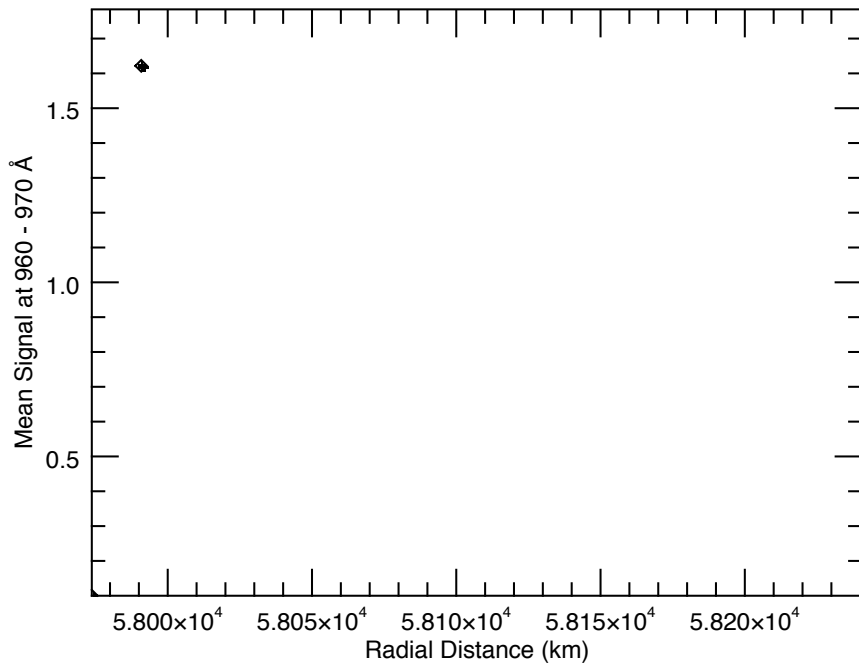
ϵ ORI Jul 8, 2017 pgLat: 54.6° LST: 5:04



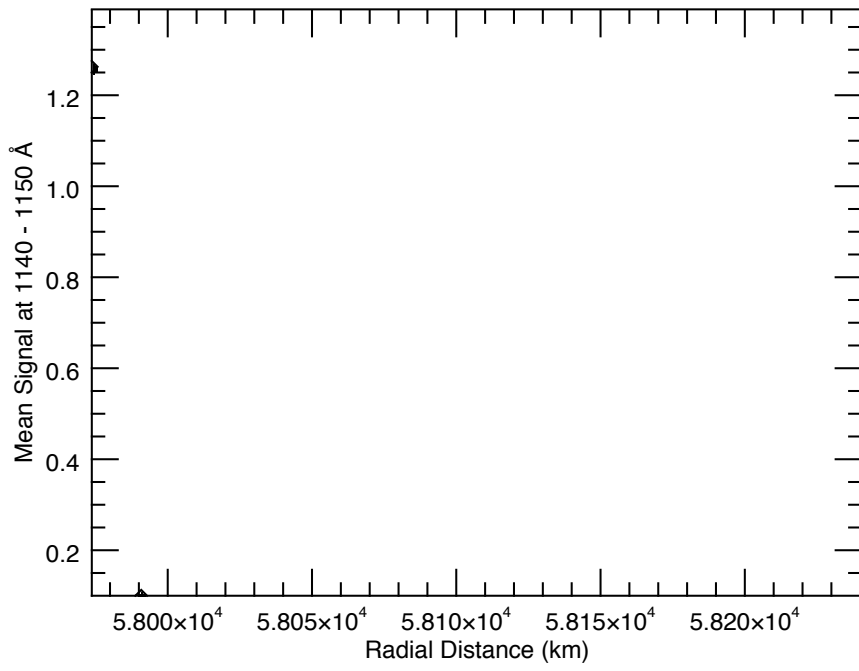
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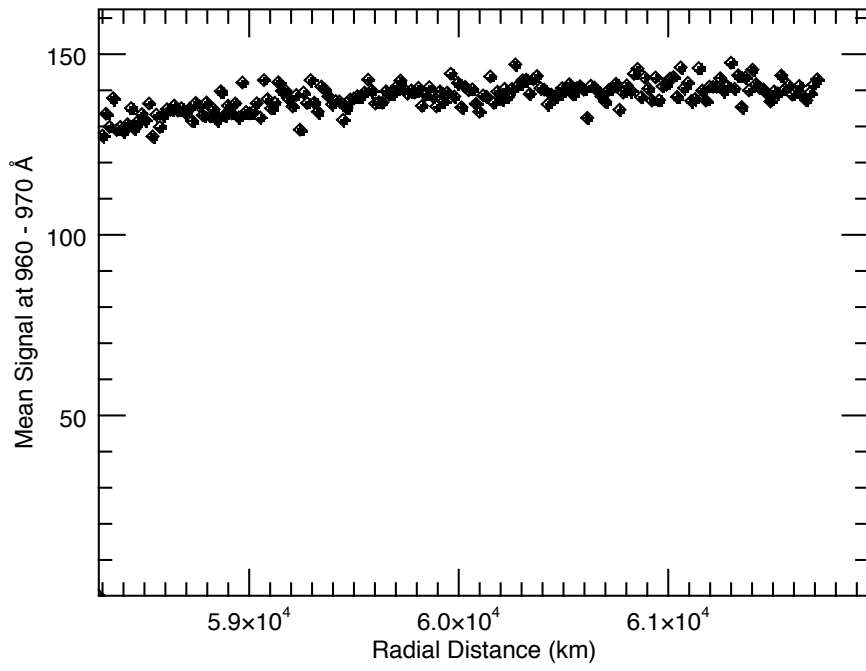
ϵ ORI Jul 8, 2017 $\bar{p}g\bar{L}at: 55.3^\circ$ LST: 5:28



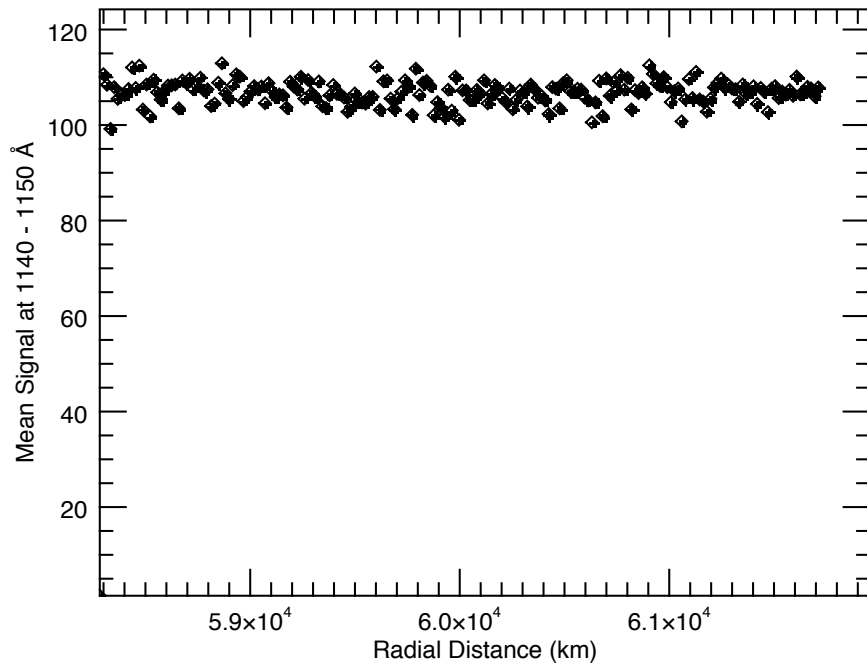
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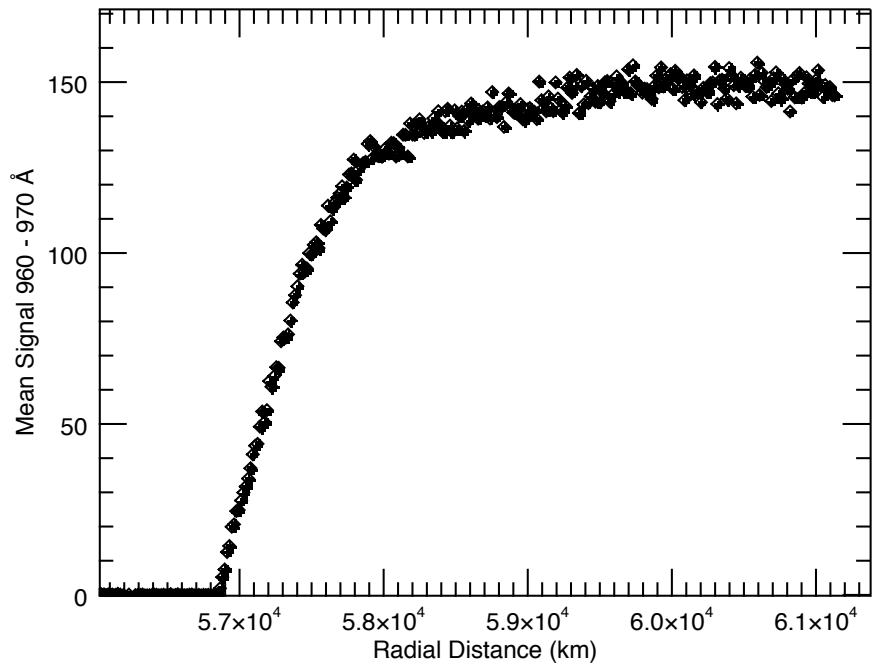
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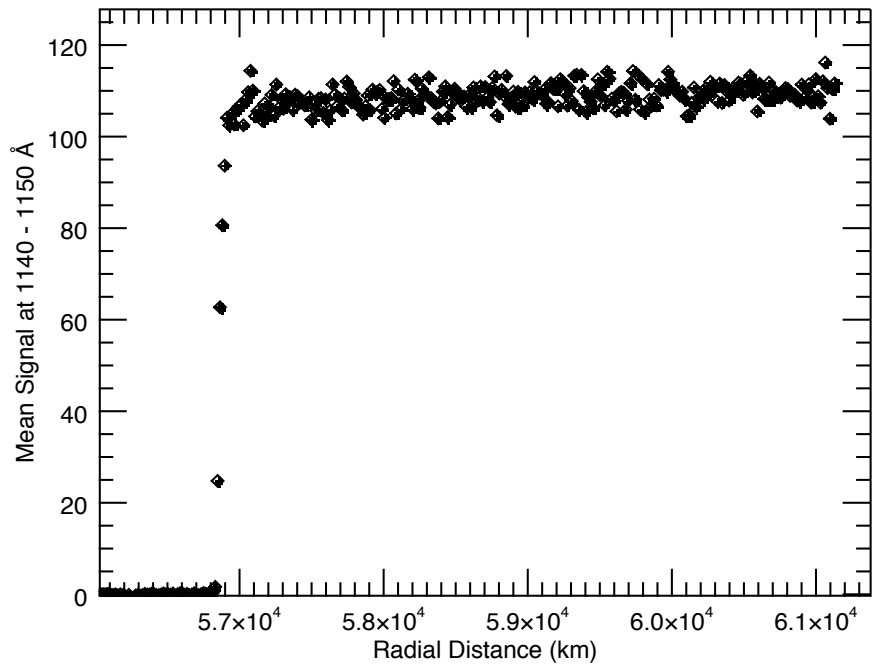
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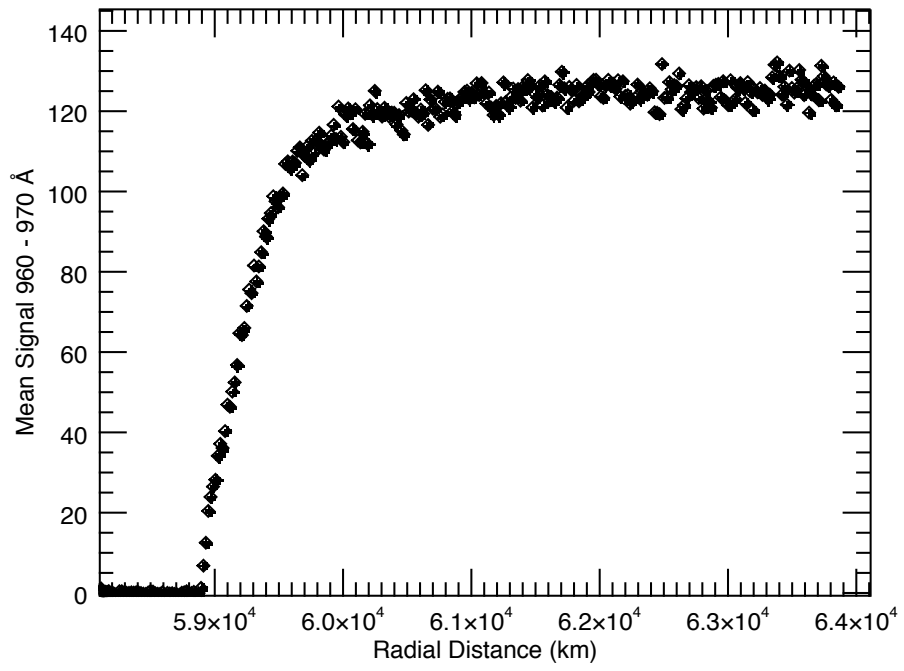
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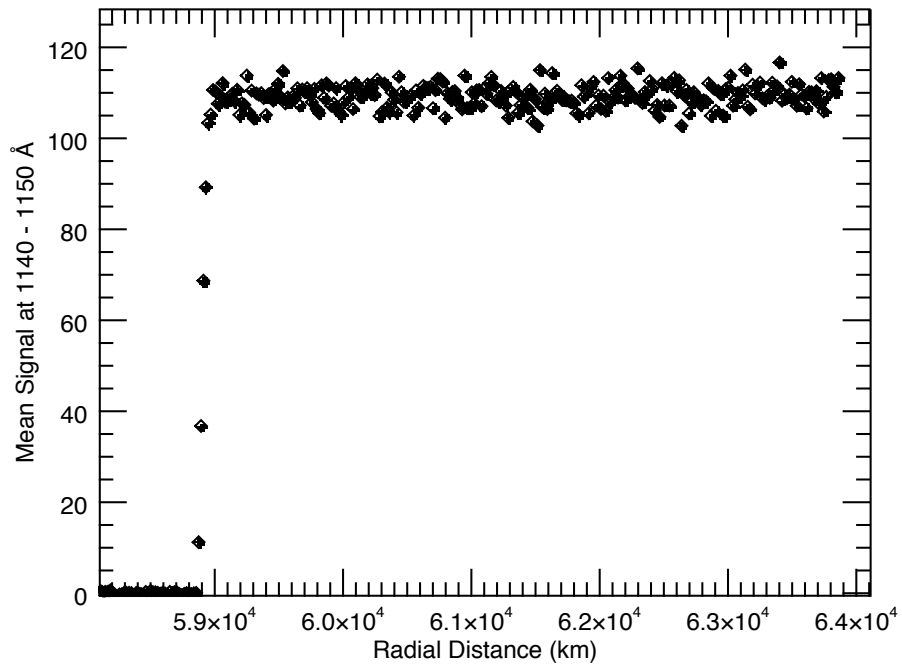
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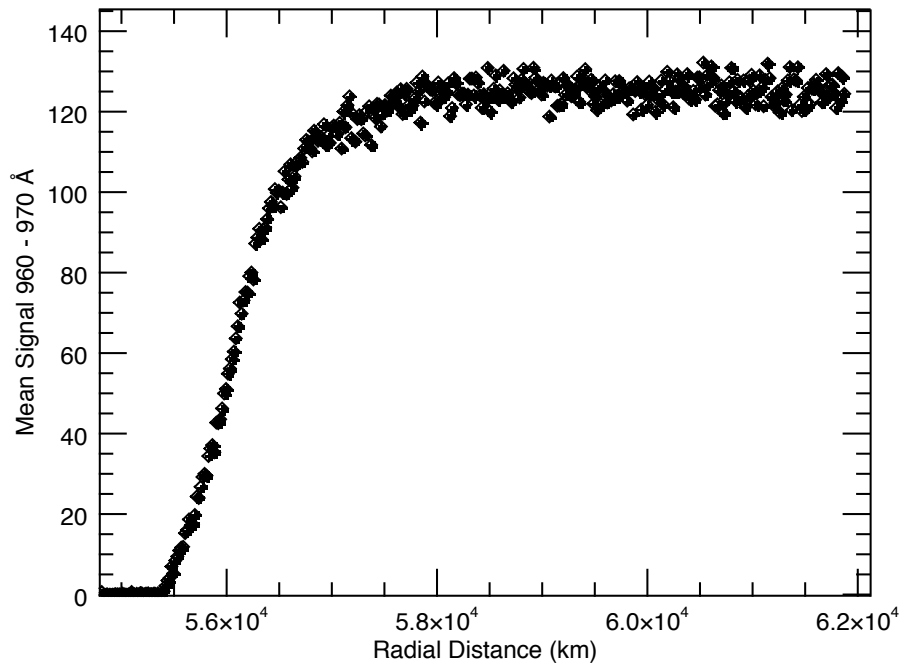
γ ORI Jul 13, 2017 pgLat: -40.7° LST: 16:58



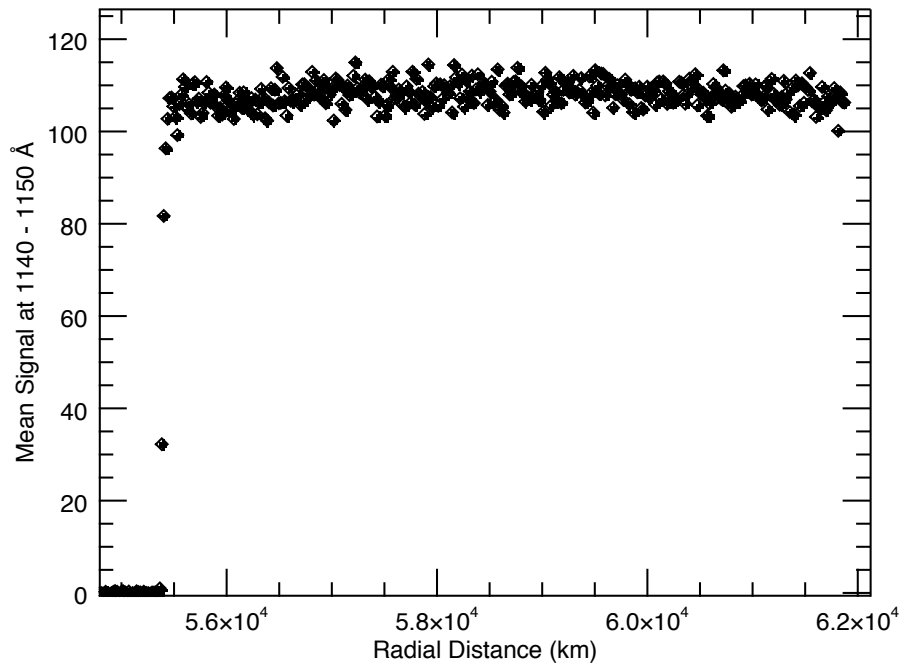
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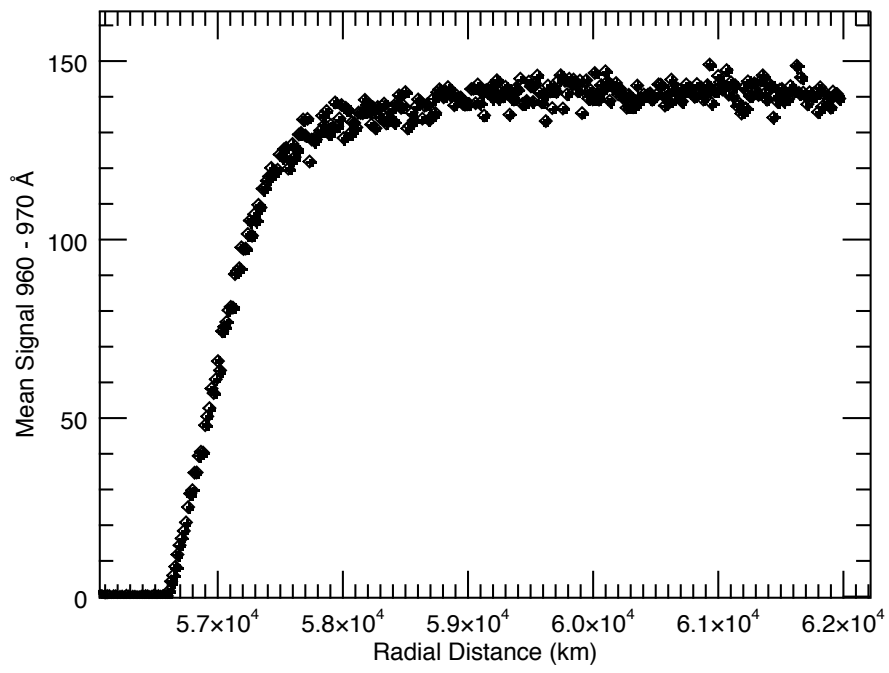
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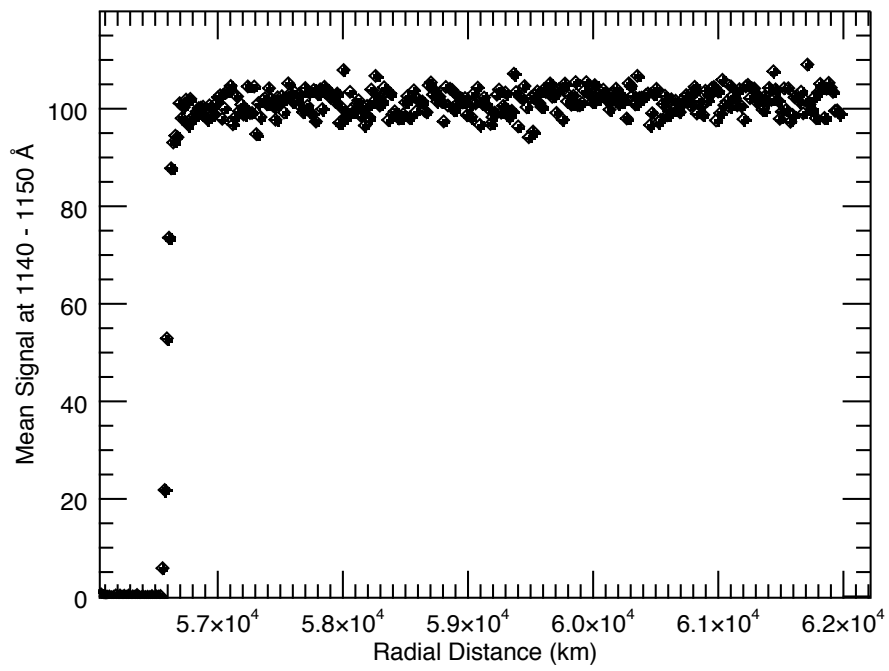
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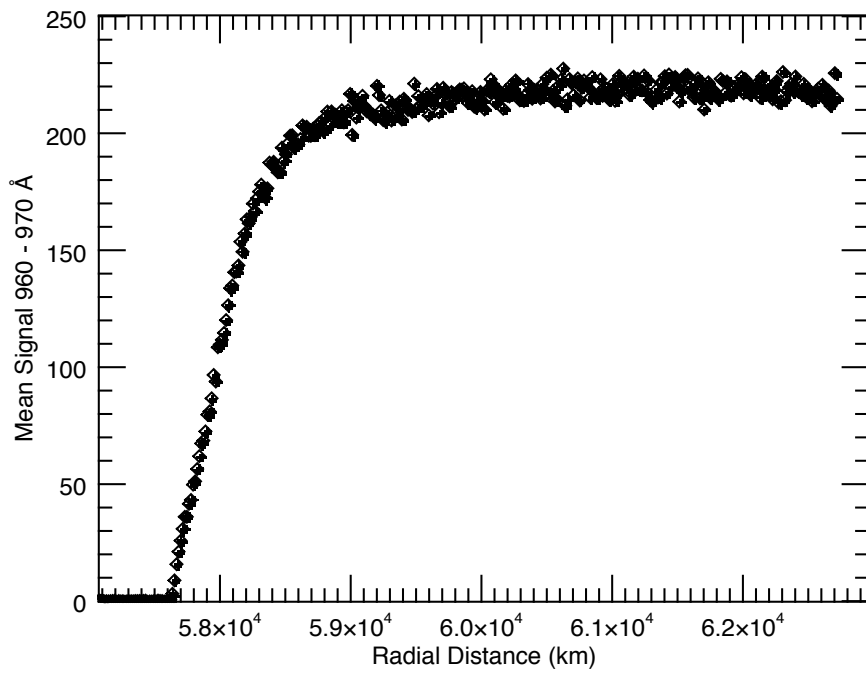
ϵ ORI Jul 14, 2017 pgLat: -60.6° LST: 17:23



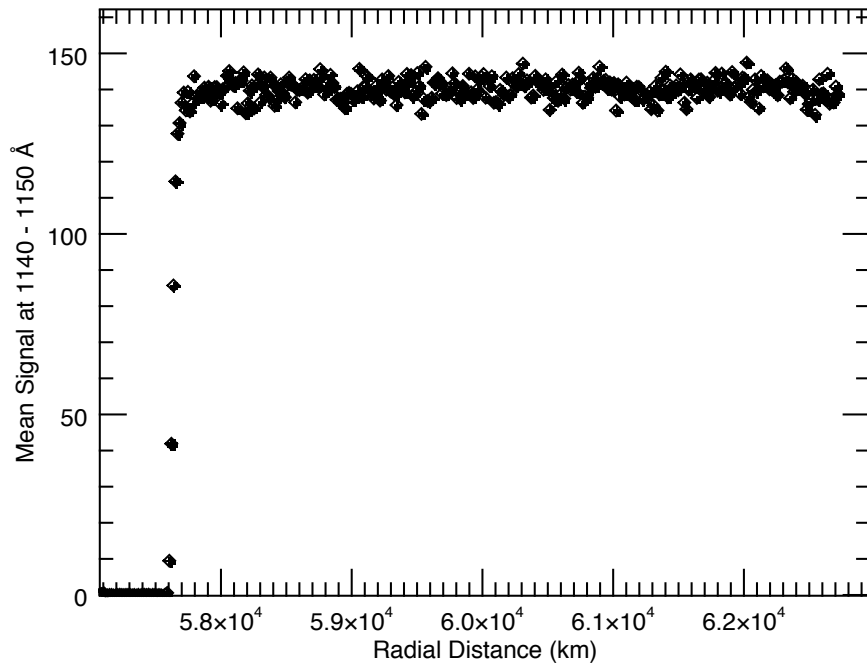
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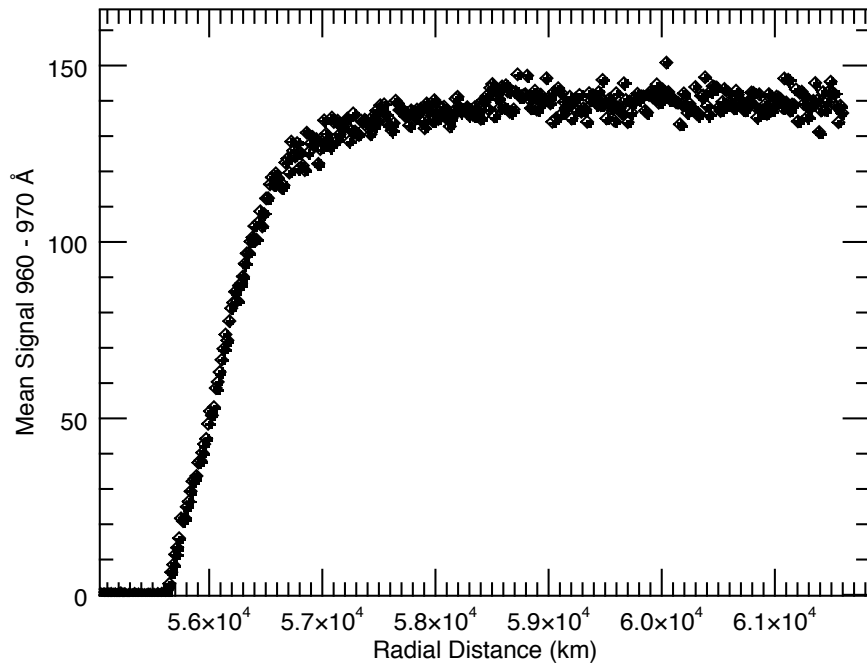
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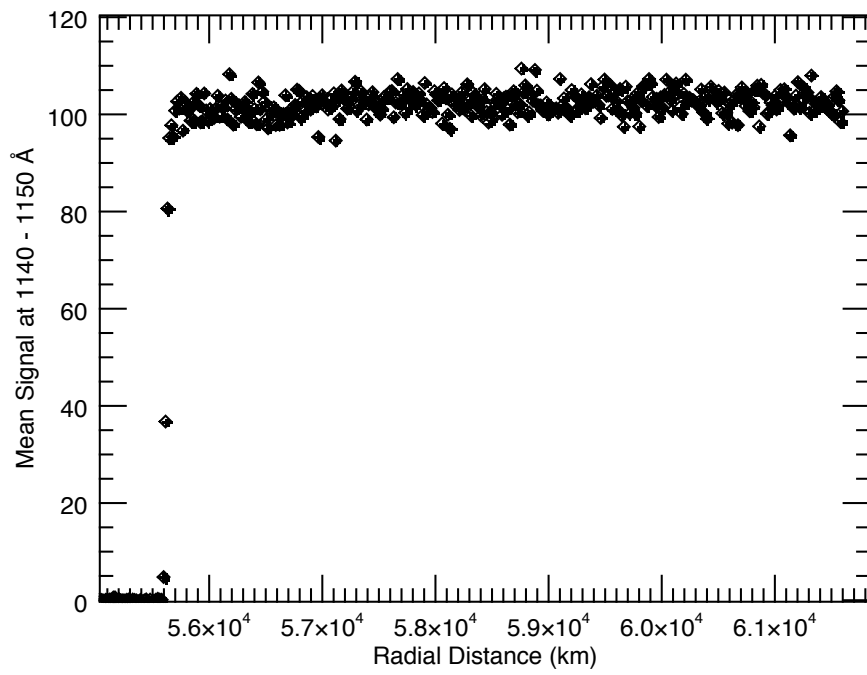
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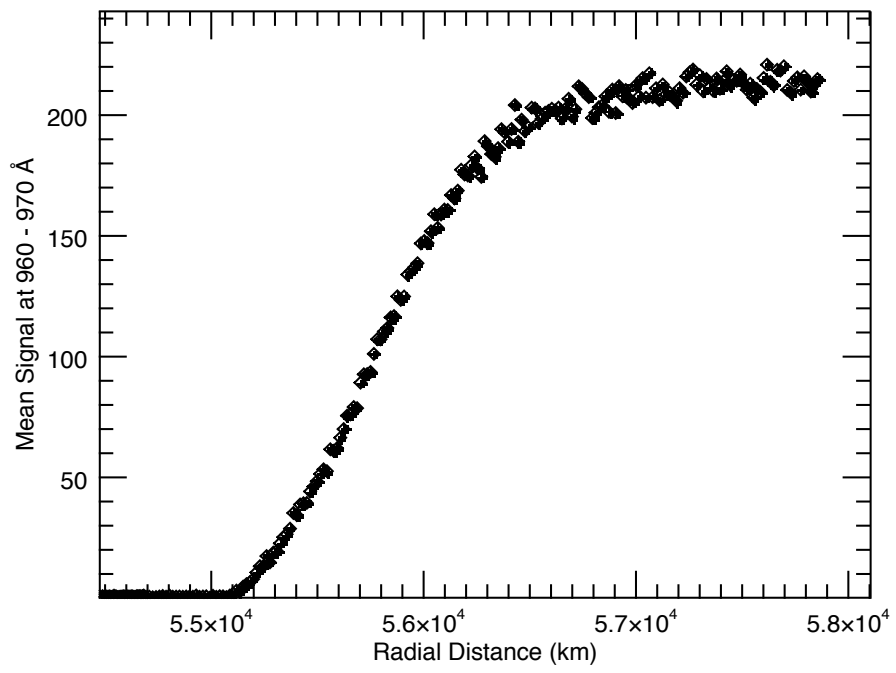
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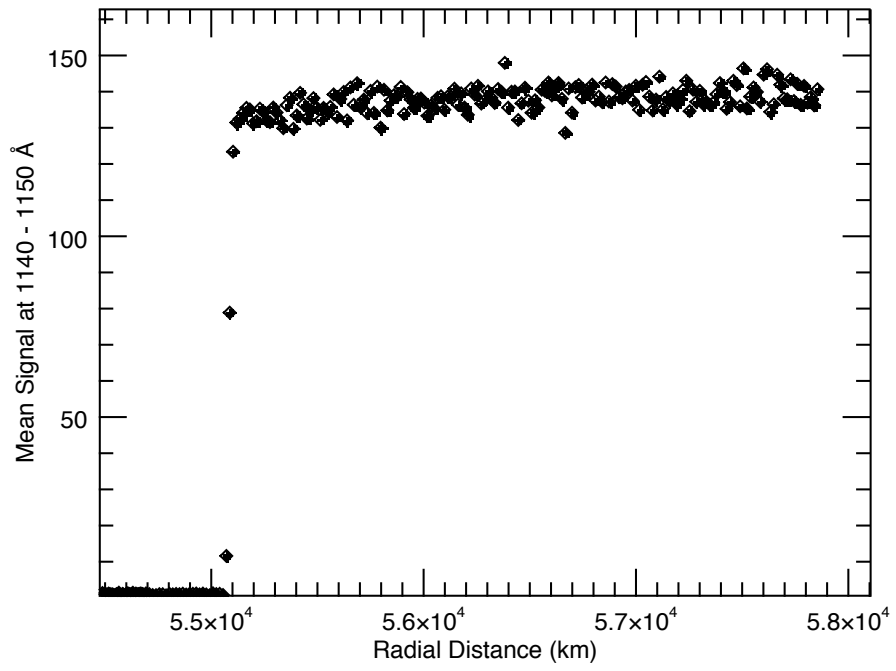
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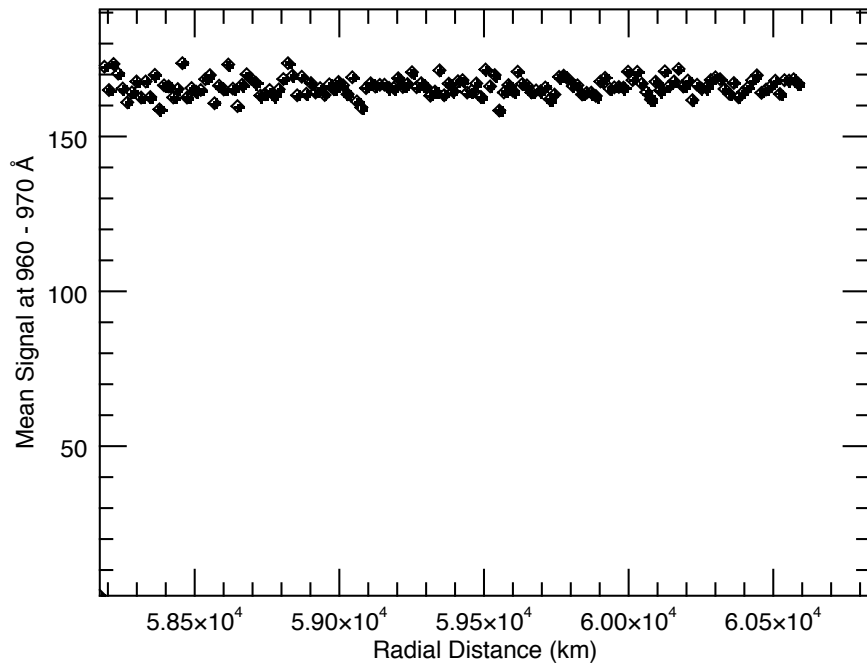
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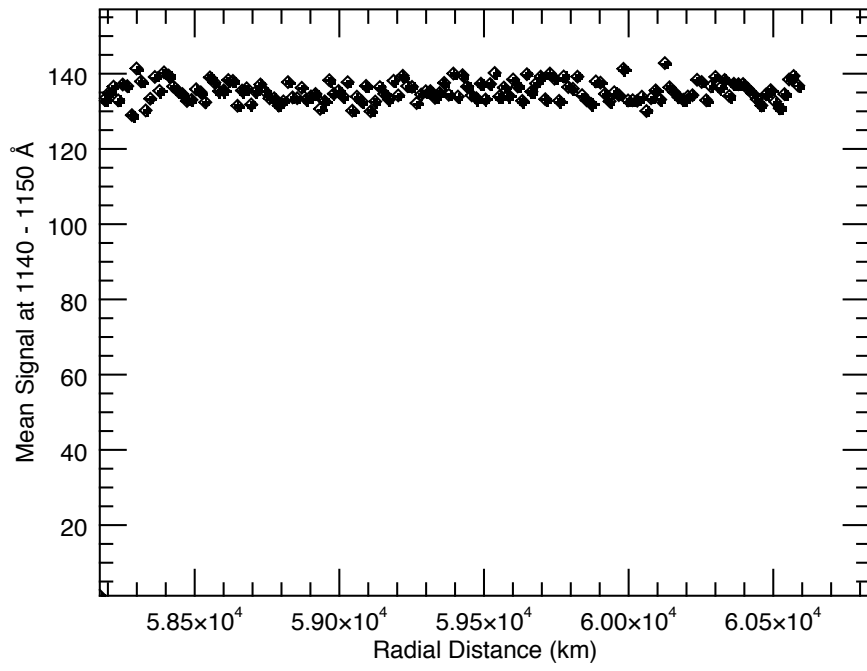
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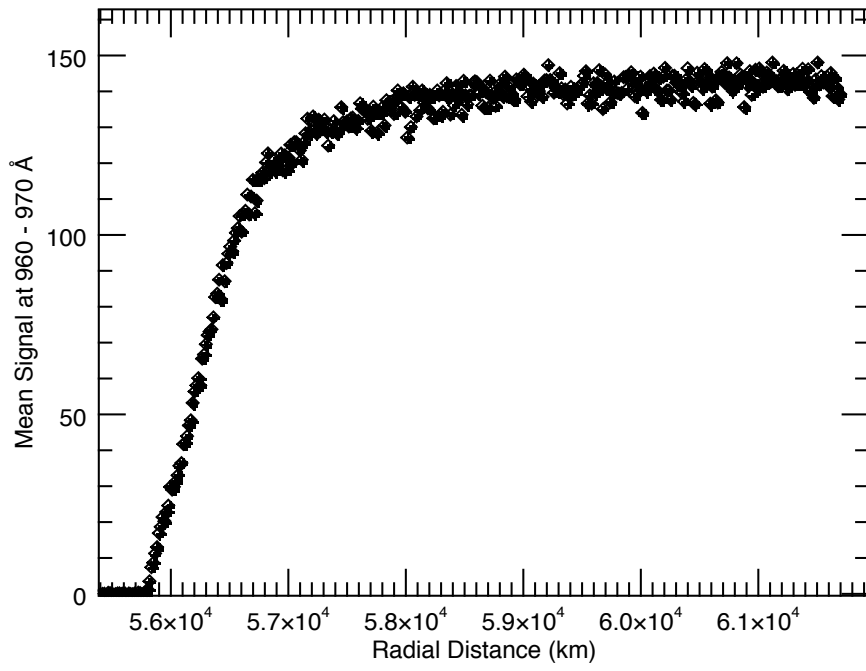
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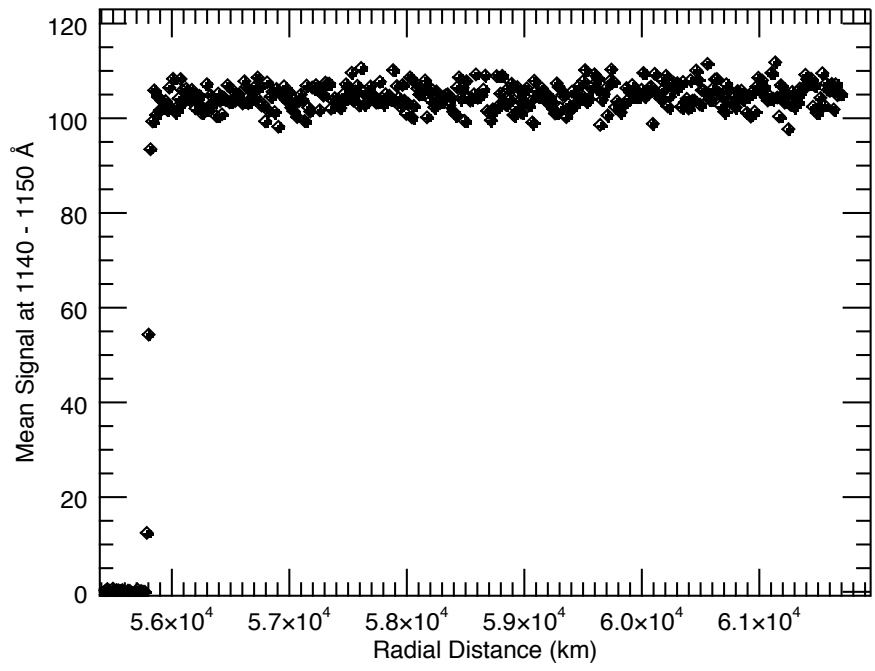
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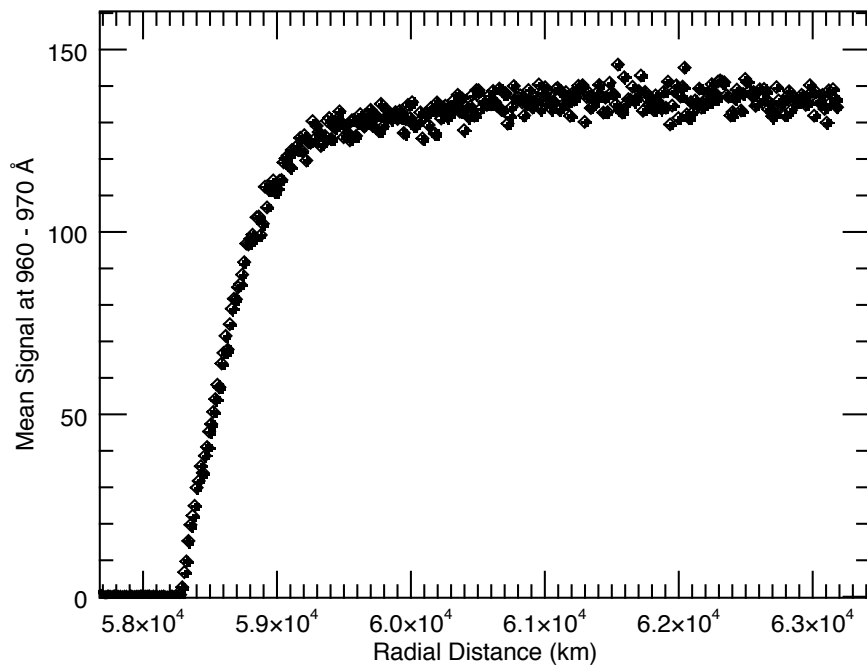
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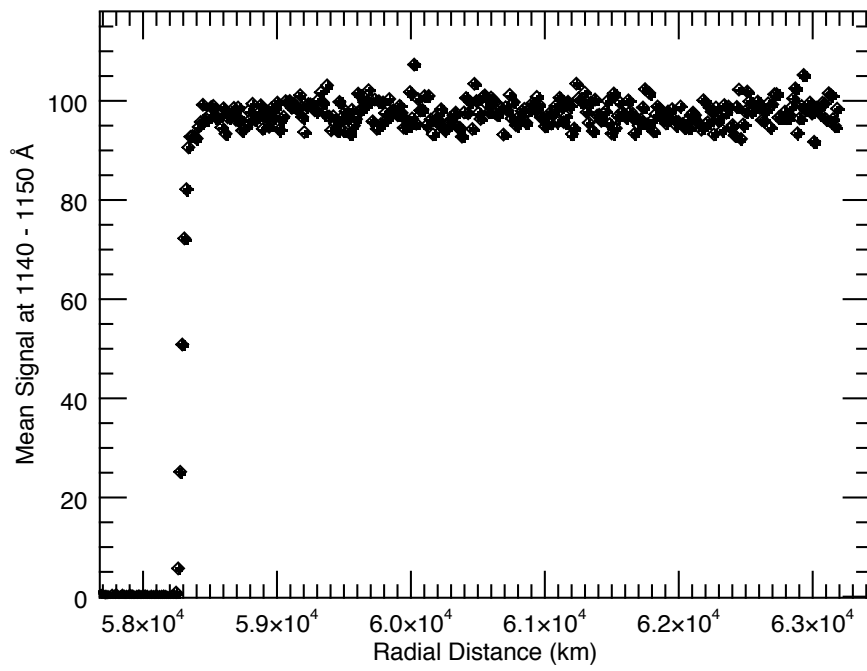
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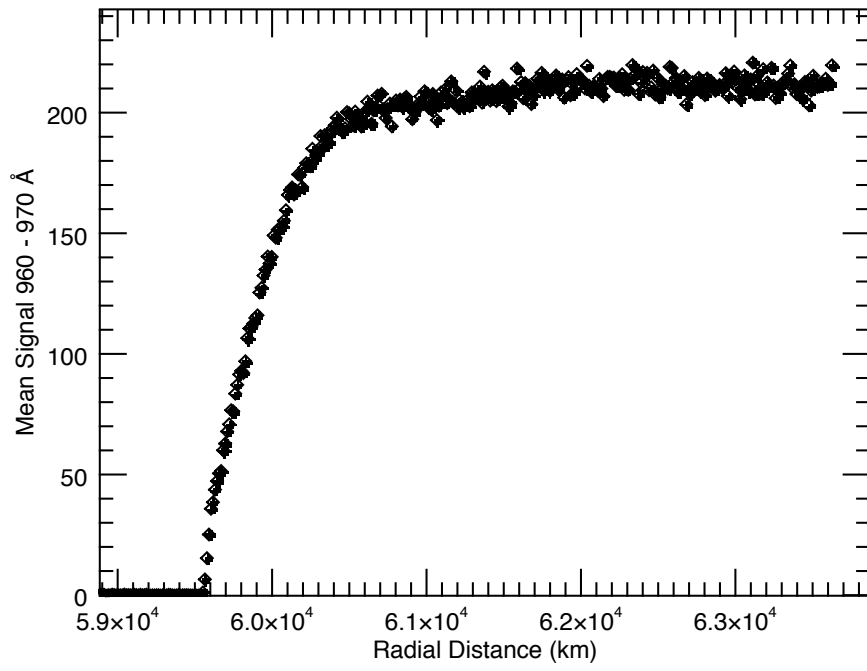
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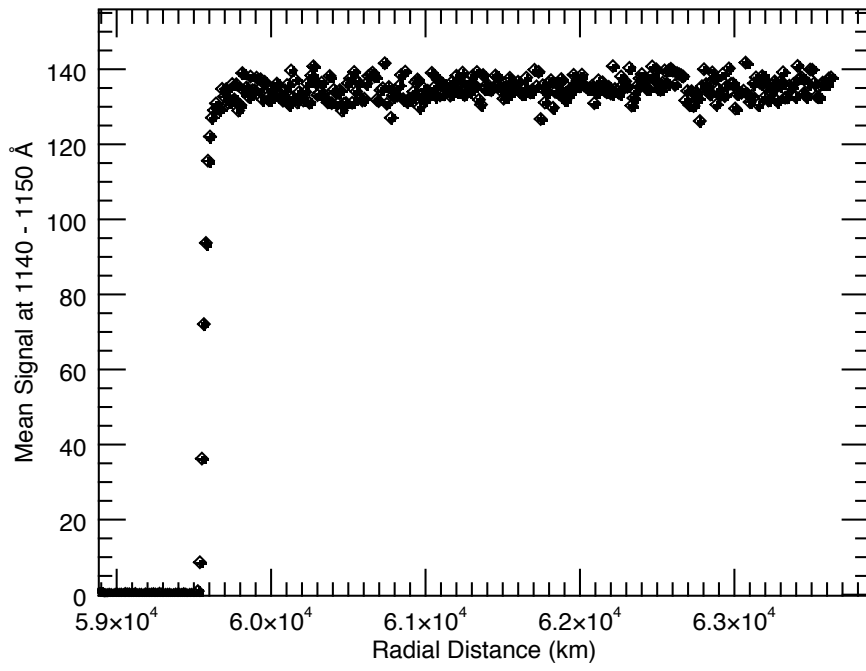
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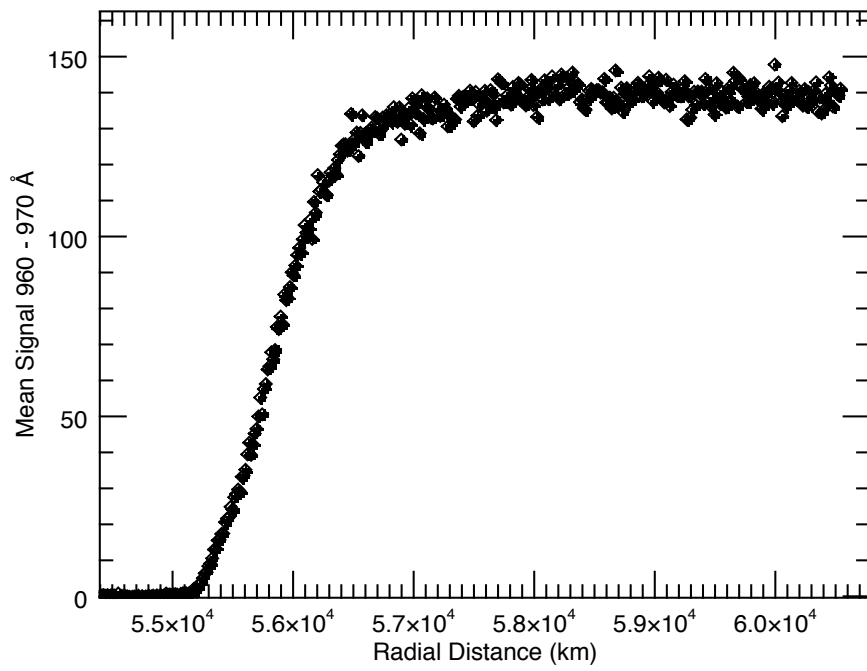
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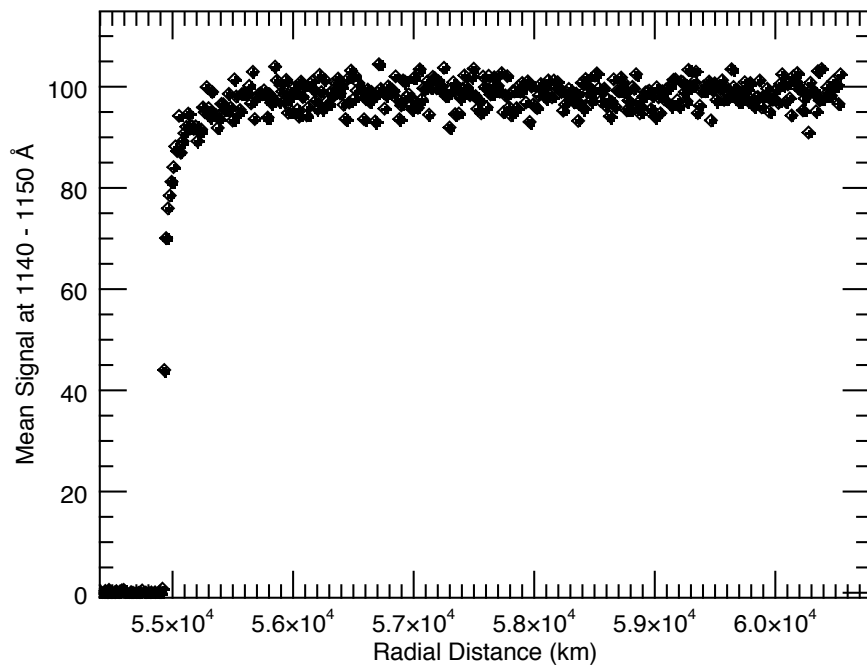
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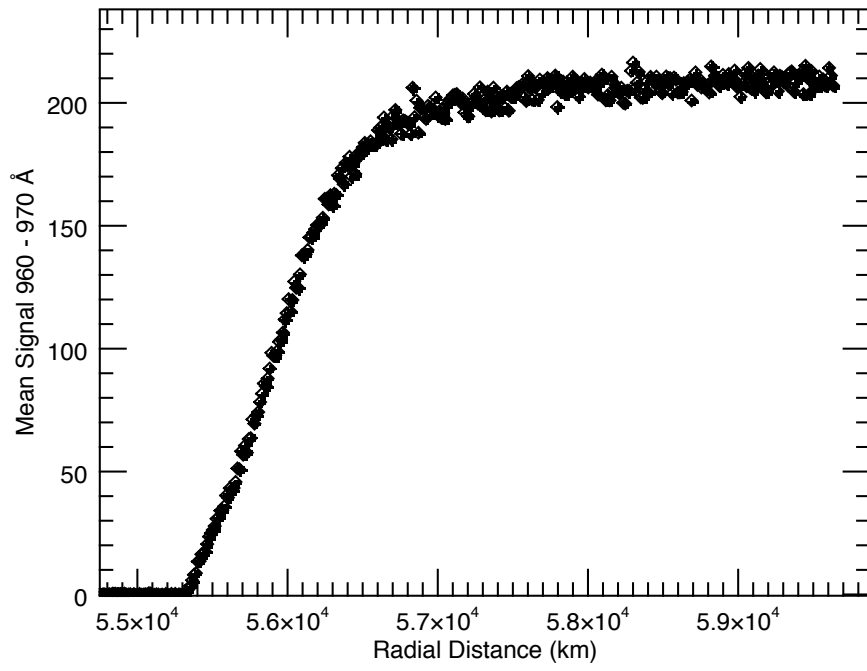
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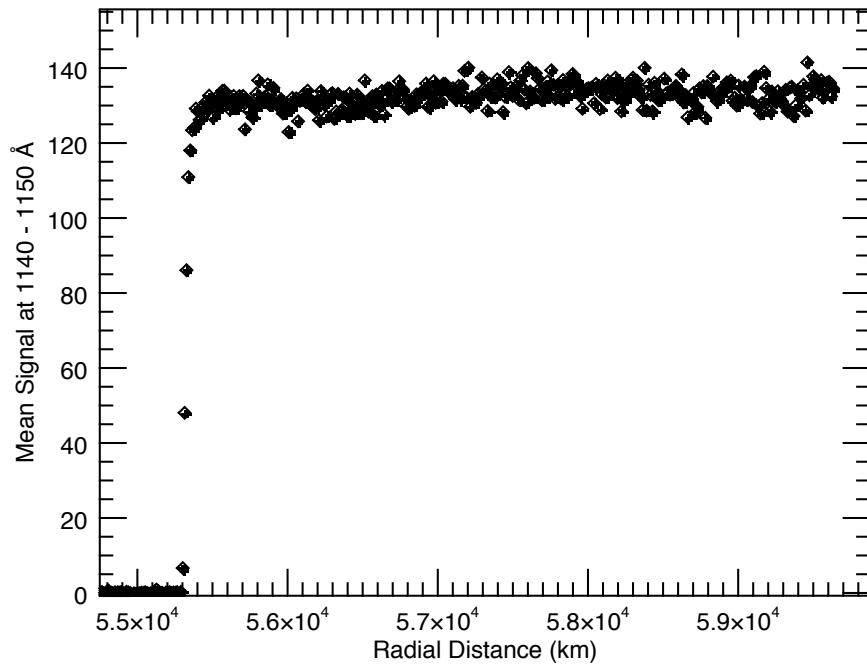
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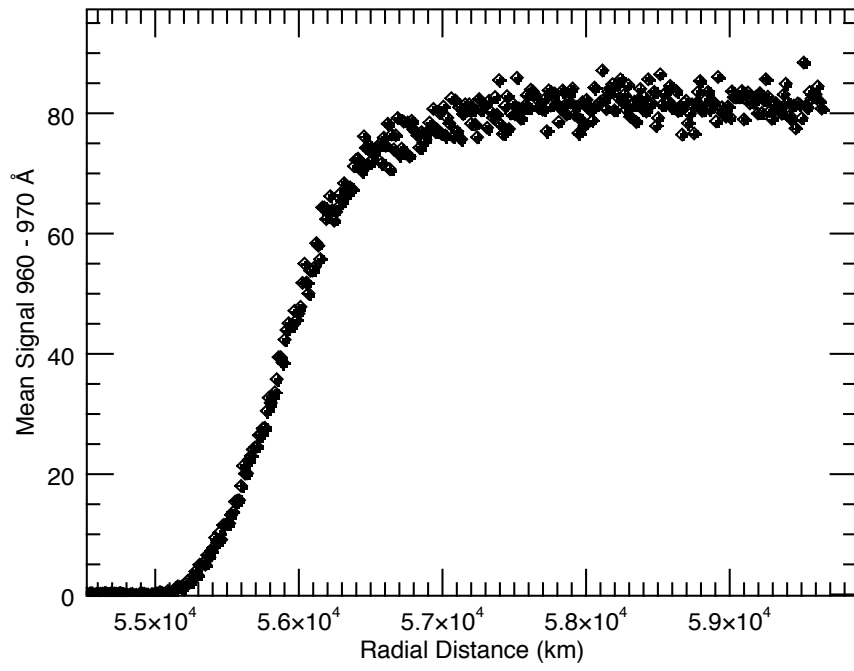
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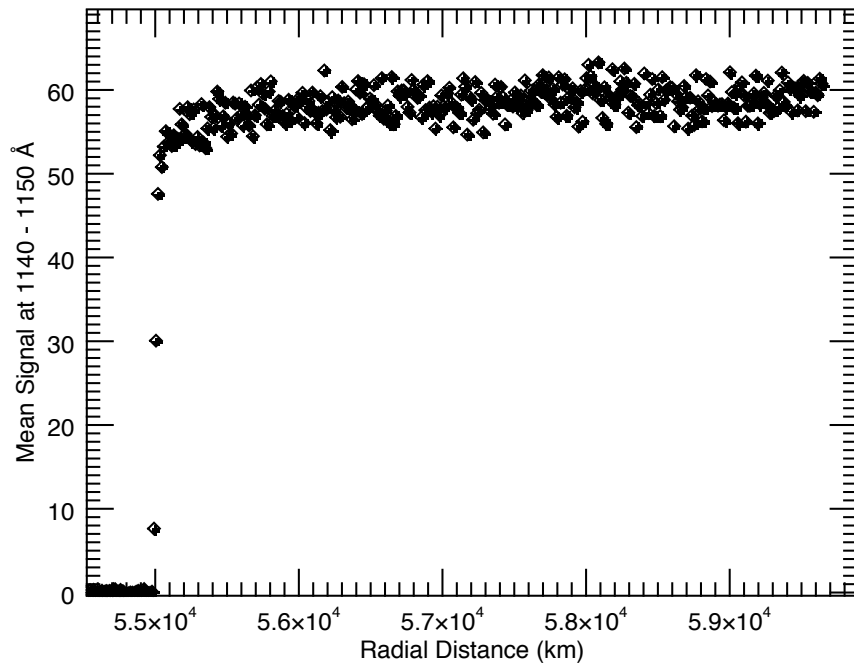
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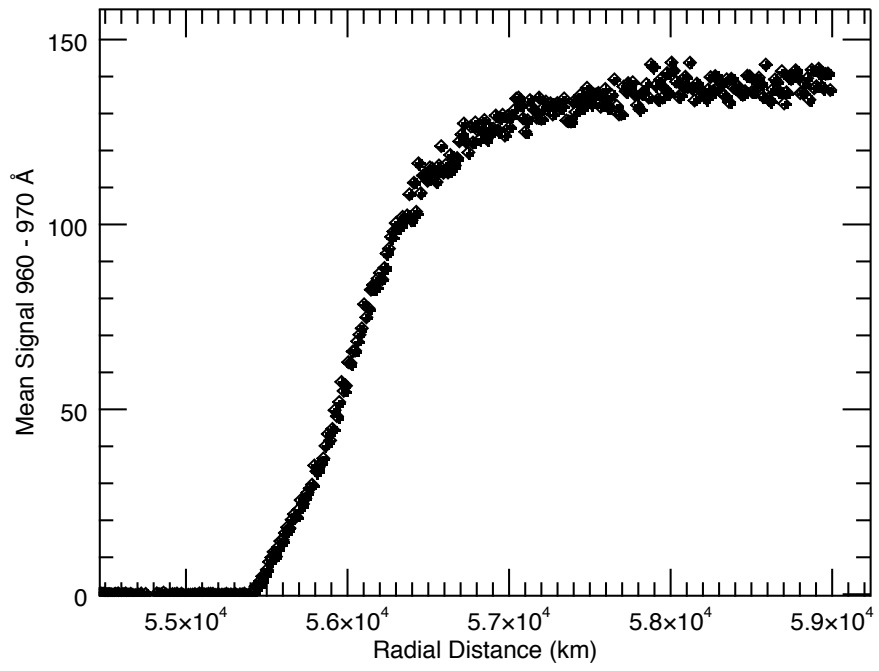
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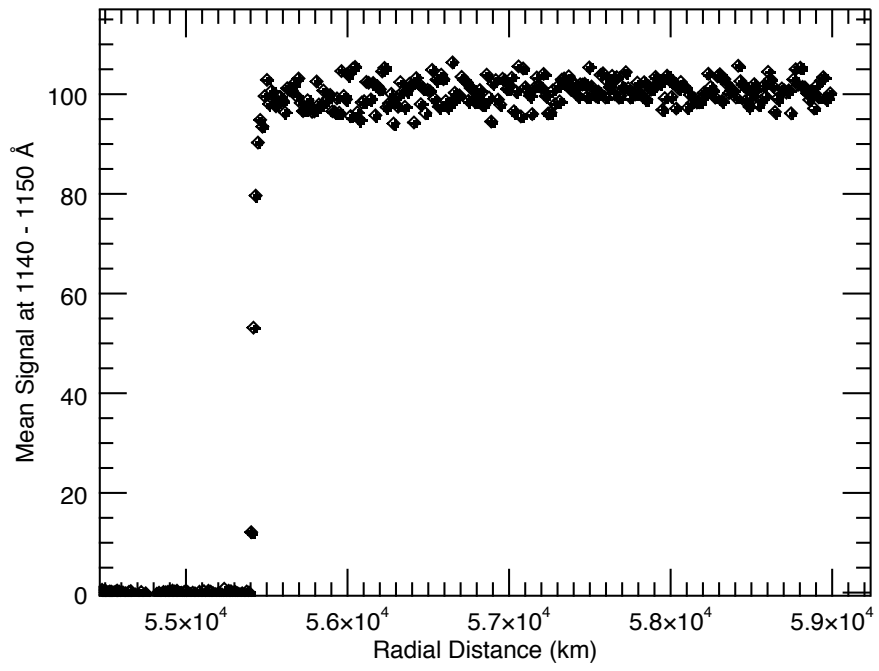
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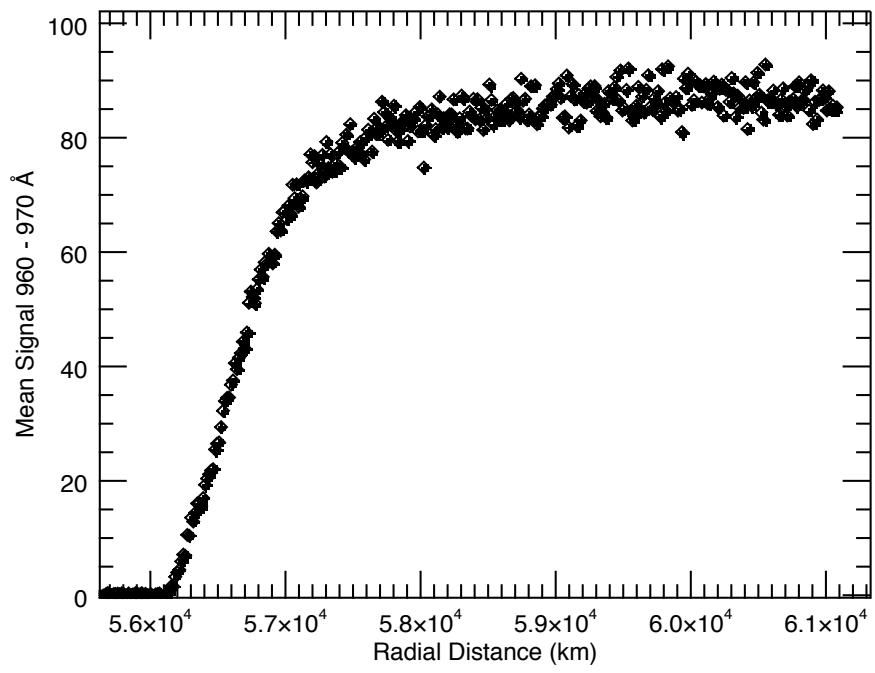
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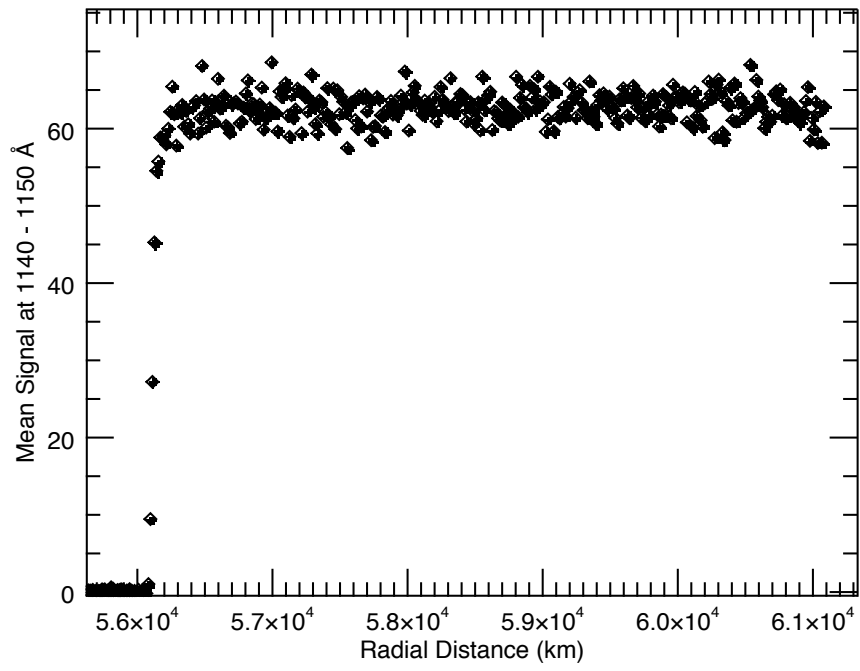
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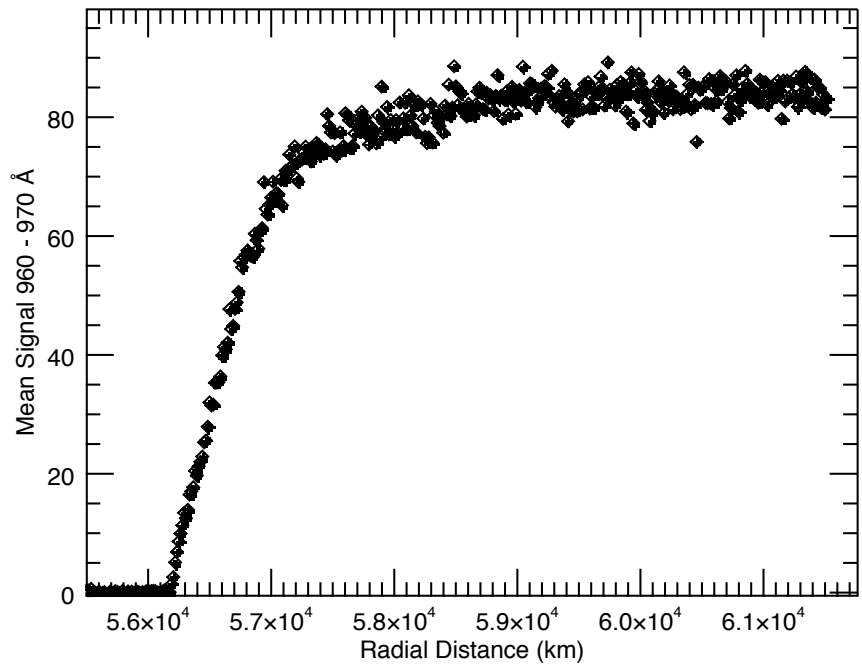
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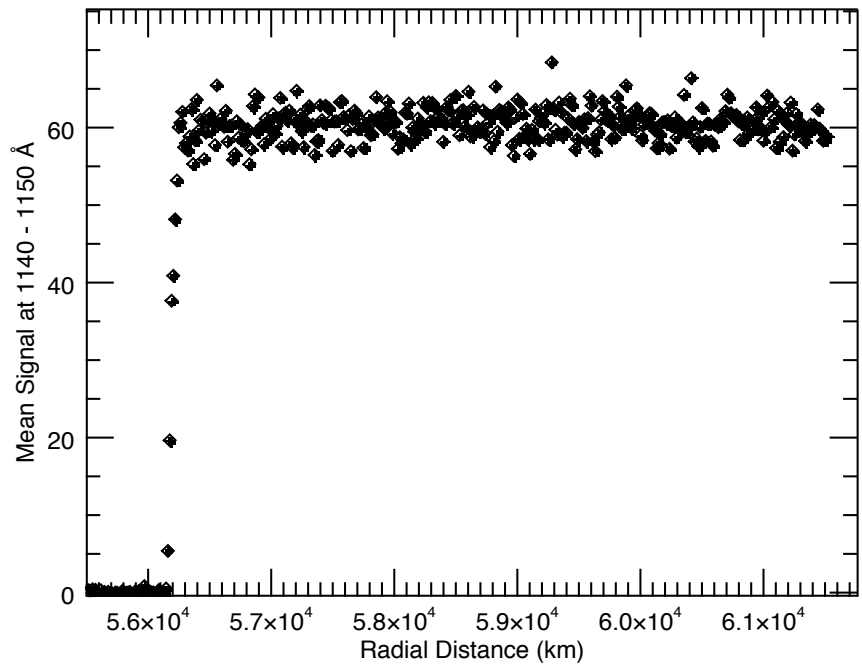
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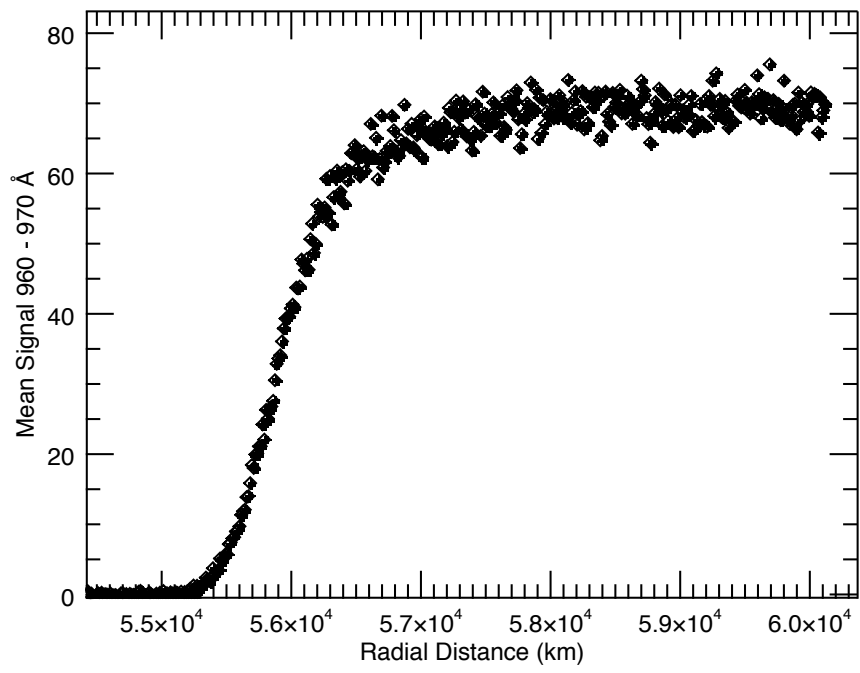
κ ORI Jul 29, 2017 pgLat: 66.8° LST: 5:42



κ ORI Jul 29, 2017 pgLat: 66.8° LST: 5:42



κ ORI Aug 4, 2017 pgLat: 85.0° LST: 5:40



κ ORI Aug 4, 2017 pgLat: 85.0° LST: 5:40

