MWA PRINCIPAL SCIENTIST REPORT

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- ^{3.} CSIRO Space & Astronomy, Perth

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Stefan Duchesne | Deputy Principal Scientist

^{1.} CSIRO Space & Astronomy, Perth

MWA Project Meeting | July 2023



► New papers:

- 18 MWA papers accepted
- 6 Collaboration Papers submitted

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► New totals:

- Collaboration Papers: 179
- External Papers: 139

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	318 MWA papers st beginning of Sci.C



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 - External Papers: 139
- ► Citation statistics:
 - Collaboration Papers:

* N(cit) = 14.298 > Δ (cit) ~ 4.077

• External Papers:

* N(cit) = 2.491 > Δ (cit) ~ 416

318 MWA papers since beginning of Sci.Op.



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► In December I posed a question:

• Who will submit our 300th paper?

318 MWA papers since beginning of Sci.Op.



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MWA (SCIENCE) HIGHLIGHTS















GLEAM-X ULPT; Hurley-Walker et al. (2022)







Solar, Heliospheric & Ionospheric⁽⁾(SHI)

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Transients



GLEAM-X ULPT; Hurley-Walker et al. (2022)









Solar, Heliospheric & Ionospheric⁰(SHI)

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GLEAM-X ULPT; Hurley-Walker et al. (2022)



mwa_hyperdrive documentation

Introduction





mwa_hyperdrive (simply referred to as hyperdrive) is calibration software for the Murchison
Widefield Array radio telescope. The documentation contained in this book aims to help understand
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Hyperdrive: ASTRO3D's new open-access calibration software suitable for all MWA uses

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MWA metadata and quality metrics (for EoR)

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MWA metadata and quality metrics (for EoR)



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-27.00	2	-7.0	8 0.0	9 0.67	5.56	126	5 1	1 3	3 0.21	0.18	0	0 0.00	0.00000020297	0.113	676.0	383989.4	319.52	8.82	45.45	4.75	45.40	4.75	0.0079	2.1807	0.0070	5
-27.00	2	-6.5	8 0.0	9 0.68	5.48	126	3 1	1 3	3 0.21	0.18	0	0 0.00	0.0000019858	0.087	644.6	383466.1	320.27	8.61	44.92	4.56	44.88	4.55	0.0079	2.2851	0.0054	4
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-27.00	2	-8.6	0 0.0	6 0.57	1.58	127		1 3	3 0.20	0.18	1	0 0.00	0.0000023272	0.777	678.4	387987.4	305.71	9.39	46.83	5.33	46.81	5.33	0.0079	1.8932	0.0073	3
-27.00	2	-8.1	0 0.0	6 0.58	1.55	127		1 3	3 0.20	0.18	1	0 0.00	0.00000019176	0.803	696.9	390305.9	311.79	9.26	46.77	5.25	46.73	5.24	0.0079	2.0127	0.0051	1
-27.00	2	-7.6	0 0.0	7 0.59	1.65	127		1 3	3 0.20	0.19	1	0 0.00	0.0000020563	0.845	645.4	388032 9	309.67	8.72	44.94	4.81	44.92	4.81	0.0080	2.0894	0.0083	3
-27.00	2	-7.1	0 0.0	7 0.58	1.70	127		1 3	3 0.20	0.19	1	0 0.00	0.00000018860	0.811	675.8	388066.1	326.50	9.06	47.49	4.94	47.47	4.94	0.0079	2.1699	0.0084	4
-27.00	2	-6.5	7 0.0	7 0.56	1.75	127		1 3	3 0.20	0.18	1	0 0.00	0.00000017947	0.810	636.0	388037.8	318.31	8.54	44.66	4.54	44.67	4.54	0.0079	2.2780	0.0065	5
-27 00	2	-6.0	6 0.0	7 0.56	1.84	127		1 3	3 0.20	0.18	1	0 0.00	0.0000018162	0.777	657.4	386356 4	320.68	8 39	44 11	4.32	44 10	4.33	0.0078	2 3451	0.0055	5

Capturing quality metrics directly via Google API



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Introduction



mwa_hyperdrive (simply referred to as hyperdrive) is calibration software for the Murchison Widefield Array radio telescope. The documentation contained in this book aims to help understand how to use it and how it works.

Hyperdrive: ASTRO3D's new open-access calibration software suitable for all MWA uses





Congratulations to Dr. Nichole Barry on the joint win of the ASA's Louise Webster Prize for her 2019 paper Improving the Epoch of Reionization Power Spectrum Results from MWA Season 1 Observations



MWA metadata and quality metrics (for EoR)



	н			J	ĸ	L	MN		0	P	Q	R	S	т	U	V	w	×	Y	Z	AA	AB	AC	AD	AE	AF	AG	
SE	SWE	ETV	ST VRAP	HYP IONO MAG	HYP IONO PCA	HYP IONO QA	DB DB FLA	G D S D	NS N DEAD DIPS	TOTAL FLAG	NON PREFLAGGED	N PRE	P N CAL	NON CONVG	CAL RMS CONVG	CAL SKEW	CAL RECV VAR	CAL DFFT POW	P_WEDGE NOSUB	P_WINDOW NOSUB	P_WEDGE SUB	P_WINDOW SUB	P_WEDGE IONOSUB	P_WINDOW IONOSUB	V RMS ALL NOSUB	XX PKS0023_026 INT NOSUB	V PKS0023_026 INT NOSUB	V R SUE
.00		2 .	10.65	0.11	0.61	3.28	126	1	33	0.21	0.18		0 0	0.00	0.0000028655	0.151	688.7	387933.6	293.64	11.02	51.85	6.76	51.81	6.76	0.0080	1.4983	0.0064	
.00		2 .	10.15	0.12	0.60	2.93	126	1	33	0.21	0.18		0 0	0.00	0.0000026697	0.150	700.3	385843.1	296.88	10.76	50.80	6.44	50.76	6.43	0.0080	1.5898	0.0091	
.00		2	-9.62	0.12	0.58	2.88	126	1	33	0.21	0.18		0 0	0.00	0.0000025735	0.140	661.6	385476.2	299.75	10.32	49.40	6.04	49.38	6.04	0.0080	1.7059	0.0078	
.00		2	-9.12	0.11	0.62	3.57	126	1	33	0.21	0.18		0 0	0.00	0.0000024620	0.113	660.5	384917.4	304.60	10.03	48.71	5.80	48.70	5.80	0.0080	1.7942	0.0063	
.00		2	-8.61	0.10	0.62	3.50	126	1	33	0.21	0.18		0 0	0.00	0.0000023436	0.146	690.1	386191.0	308.51	9.68	47.84	5.50	47.84	5.50	0.0080	1.8968	0.0072	
.00		2	-8.11	0.10	0.62	3.25	126	1	33	0.21	0.18		0 0	0.00	0.0000023300	0.092	685.3	385545.6	313.48	9.36	47.29	5.29	47.27	5.29	0.0080	1.9676	0.0077	
.00	2	2	-7.58	0.10	0.63	3.76	126	1	33	0.21	0.18		0 0	0.00	0.00000021047	0.139	682.1	383193.9	317.86	9.00	46.39	4.97	46.34	4.96	0.0079	2.1134	0.0075	
.00	2	2	-7.08	0.09	0.67	5.56	126	1	33	0.21	0.18		0 0	0.00	0.00000020297	0.113	676.0	383989.4	319.52	8.82	45.45	4.75	45.40	4.75	0.0079	2.1807	0.0070	
.00	2	2	-6.58	0.09	0.68	5.48	126	1	33	0.21	0.18		0 0	0.00	0.00000019858	0.087	644.6	383466.1	320.27	8.61	44.92	4.56	44.88	4.55	0.0079	2.2851	0.0054	
.00	2	2	-6.07	0.08	0.73	8.40	126	1	33	0.21	0.18		0 0	0.00	0.00000019141	0.104	652.3	382041.3	321.61	8.47	44.08	4.35	44.04	4.35	0.0079	2.3482	0.0072	
.00	2	2	-5.54	0.08	0.76	10.00	126	1	33	0.21	0.18		0 0	0.00	0.00000016964	0.096	660.7	384578.9	323.67	8.39	43.91	4.22	43.85	4.22	0.0078	2.4209	0.0048	
.00	2	2	-5.04	0.08	0.77	10.54	126	1	33	0.21	0.18		0 0	0.00	0.00000015966	0.129	695.3	382522.0	325.32	8.30	43.31	4.07	43.27	4.07	0.0079	2.4904	0.0068	
.00	<u> </u>	2	-4.54	0.09	08.0	12.27	126	1	33	0.21	0.18		0 0	0.00	0.00000016278	0.142	699.0	379319.8	325.16	8.24	43.20	3.96	43.17	3.96	0.0078	2.5635	0.0050	-
.00		2	-4.04	0.09	0.73	8.07	120	-	33	0.21	0.19		0 0	0.00	0.00000014802	0.153	701.0	380331.1	324.84	8.50	43.17	4.07	43.15	4.07	0.0079	2.6313	0.0066	
.00		0	-3.00	0.09	0.75	9.32	127	-	33	0.20	0.18		0 1	0.16	0.00000017940	1.002	600.7	170001.0	321.40	14.07	63.53 EE 4E	10.03	63.49 EE 42	10.83	0.0077	1.5/04	0.0056	
.00		0	-2.50	0.10	0.77	10.88	12/		33	0.20	0.18			0.16	0.00000017756	1.093	602.0	1/0/68.9	317.15	11.71	55.45	7.00	55.42	7.00	0.0077	1.0/24	0.0052	
.00		0	-2.00	0.10	0.76	10.35	127		33	0.20	0.18		0 1	0.16	0.00000016732	1.001	693.2	172506.0	310.31	10.96	54.01	7.30	53.99	1.29	0.0077	1.7705	0.0074	
.00		0	-0.06	0.10	0.70	10.39	127	4	33	0.20	0.18		0	0.16	0.00000015368	1.000	705.3	172390.0	310.97	10.60	52.72	6.53	51.09	6.53	0.0077	1.0090	0.0094	
.00		0	-0.46	0.10	0.63	4.51	127	4	33	0.20	0.18		0 1	0.16	0.00000016338	1.005	672.5	169514.5	320.86	10.50	50.64	6.19	50.63	6.19	0.0077	2.0648	0.0076	
100		2	11 17	0.14	0.68	7 12	127	4	33	0.20	0.10		0 0	0.00	0.00000010350	0.112	695.2	391845 5	300.80	11.47	54.18	7 31	54 17	7.31	0.0080	1 3925	0.0082	
.00		2	10 14	0.14	0.00	7 70	127	4	33	0.20	0.10		0 0	0.00	0.00000026938	0.106	738.5	300868.0	304.91	10.85	51.02	6.55	51.85	6.54	0.0080	1.6057	0.0074	
100		2	-9.63	0.13	0.68	6.84	127	4	33	0.20	0.18		0 0	0.00	0.00000024782	0 111	728.8	387887 0	307.80	10.44	50.96	6.21	50.93	6.21	0.0080	1 6814	0.0086	
100		2	-9.13	0.14	0.66	6 14	127	1	33	0.20	0.18		0 0	0.00	0.00000024006	0.139	681.0	386649 7	312.49	10.10	49.81	5.90	49.81	5.90	0.0080	1 8107	0.0063	
.00		2	-8.60	0.14	0.62	4.14	127	1	33	0.20	0.18		0 0	0.00	0.0000023999	0.134	732.5	389761.9	316.04	9.73	48.94	5.61	48.93	5.61	0.0080	1.9039	0.0054	
.00		2	-8.10	0.14	0.63	4.67	127	1	33	0.20	0.18		0 0	0.00	0.00000023701	0.111	713.8	387966.6	319.62	9.34	47.59	5.29	47.56	5.29	0.0080	1.9877	0.0073	
.00		2	-7.60	0.13	0.60	3.40	127	1	33	0.20	0.18		0 0	0.00	0.00000022584	0.095	680.9	387050.8	325.46	9.12	47.32	5.08	47.22	5.08	0.0080	2.0857	0.0067	
.00		2	-7.09	0.13	0.62	4.25	127	1	33	0.20	0.18		0 0	0.00	0.00000020099	0.090	673.1	386893.2	326.08	8.89	46.46	4.87	46.43	4.87	0.0080	2.1764	0.0067	
.00)	2	-6.56	0.13	0.60	3.32	127	1	33	0.20	0.18		0 0	0.00	0.0000020564	0.100	680.5	388257.8	328.97	8.70	45.46	4.61	45.50	4.61	0.0079	2.2624	0.0057	
.00		2	-6.06	0.12	0.61	3.17	127	1	33	0.20	0.18		0 0	0.00	0.00000018648	0.131	684.8	386124.3	330.40	8.60	45.36	4.46	45.34	4.46	0.0079	2.3344	0.0060	
.00		2	-5.56	0.12	0.58	2.95	127	1	33	0.20	0.18		0 0	0.00	0.00000016678	0.135	677.2	386590.8	333.51	8.52	44.91	4.31	44.86	4.31	0.0079	2.4280	0.0053	
.00)	2	-5.06	0.12	0.59	2.99	127	1	33	0.20	0.18		0 0	0.00	0.00000017063	0.079	690.8	384709.7	334.06	8.48	44.72	4.21	44.73	4.21	0.0078	2.4914	0.0072	
.00		2	-4.52	0.12	0.60	3.14	127	1	33	0.20	0.18		0 0	0.00	0.00000014957	0.086	719.3	383409.0	336.58	8.50	44.82	4.13	44.78	4.13	0.0079	2.5752	0.0071	
.00		2	-4.02	0.14	0.72	9.10	127	1	33	0.20	0.18		0 0	0.00	0.00000015689	0.112	716.2	383831.6	332.86	8.49	43.79	4.03	43.74	4.03	0.0078	2.6148	0.0064	
.00		0	-3.02	0.15	0.73	9.66	127	1	33	0.20	0.18		0 1	0.16	0.00000017676	1.678	684.0	174991.7	315.68	11.51	55.96	7.66	55.95	7.66	0.0079	1.5740	0.0069	
.00		0	-2.48	0.15	0.75	10.76	127	1	33	0.21	0.20		0 1	0.16	0.00000017938	1.703	686.2	172630.8	316.92	11.36	55.05	7.41	55.03	7.41	0.0079	1.6850	0.0077	
.00		0	-1.98	0.07	0.59	1.79	127	1	33	0.20	0.18		0 1	0.16	0.00000017240	1.666	719.0	172415.7	317.58	11.15	54.24	7.14	54.22	7.14	0.0079	1.7748	0.0057	
.00		2	11.18	0.07	0.59	1.69	127	1	33	0.20	0.18		1 0	0.00	0.0000024487	0.815	659.3	392146.5	292.56	11.20	52.95	7.03	52.93	7.03	0.0080	1.3879	0.0080	
.00		2 .	10.64	0.07	0.60	1.72	127	1	33	0.20	0.18		1 0	0.00	0.0000024954	0.820	681.5	391858.1	293.78	10.87	51.54	6.61	51.50	6.61	0.0079	1.5033	0.0084	
.00		2 -	10.14	0.07	0.61	2.22	127	1	33	0.20	0.19		1 0	0.00	0.0000024035	0.839	671.1	390600.E	288.15	10.30	48.81	6.11	48.77	6.11	0.0080	1.5986	0.0086	
.00		2	-9.64	0.07	0.59	1.65	127	1	33	0.20	0.19		1 0	0.00	0.0000023178	0.826	671.6	388904.8	299.92	10.18	49.51	5.96	49.49	5.96	0.0080	1.7139	0.0066	
.00	2	2	-9.14	0.06	0.62	2.32	127	1	33	0.20	0.18		1 0	0.00	0.0000021044	0.827	667.8	388209.1	300.88	9.76	47.75	5.59	47.71	5.59	0.0079	1.7912	0.0075	
.00	2	2	-8.60	0.06	0.57	1.58	127	1	33	0.20	0.18		1 0	0.00	0.0000023272	0.777	678.4	387987.4	305.71	9.39	46.83	5.33	46.81	5.33	0.0079	1.8932	0.0073	
.00	2	2	-8.10	0.06	0.58	1.55	127	1	33	0.20	0.18		1 0	0.00	0.00000019176	0.803	696.9	390305.9	311.79	9.26	46.77	5.25	46.73	5.24	0.0079	2.0127	0.0051	
.00		2	-7.60	0.07	0.59	1.65	127	1	33	0.20	0.19		1 0	0.00	0.0000020563	0.845	645.4	388032.9	309.67	8.72	44.94	4.81	44.92	4.81	0.0080	2.0894	0.0083	
.00		2	-7.10	0.07	0.58	1.70	127	1	33	0.20	0.19		1 0	0.00	0.00000018860	0.811	675.8	388066.1	326.50	9.06	47.49	4.94	47.47	4.94	0.0079	2.1699	0.0084	
.00		2	-6.57	0.07	0.56	1.75	127	1	33	0.20	0.18		0	0.00	0.00000017947	0.810	636.0	388037.8	318.31	8.54	44.66	4.54	44.67	4.54	0.0079	2.2780	0.0065	
				0.07					0.0	0.00	0.40			0.00					000 00	0.00		1 0 0	11.10	1 0 0	0 00 10	0.0151	0.00	

Capturing quality metrics directly via Google API





mwa_hyperdrive documentation

Introduction



mwa_hyperdrive (simply referred to as hyperdrive) is calibration software for the Murchison Widefield Array radio telescope. The documentation contained in this book aims to help understand how to use it and how it works.

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MWA metadata and quality metrics (for EoR)



									. A	1. 10 7 0	10							1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 -		1.1.10	1.10	140	7.46		110	
E	SWEET	LST WRAP	HYP IONO MAG	HYP IONO PCA	HYP IONO QA	DB GOOD TILES	DB FLAG TILES	WS N DEAD DIPS	TOTAL FLAG	NON	N PREP N CA	L NON CONVG	CAL RMS CONVG	CAL SKEW	CAL RECV VAR	CAL DFFT POW	P_WEDGE NOSUB	P_WINDOW NOSUB	P_WEDGE SUB	P_WINDOW SUB	P_WEDGE IONOSUB	P_WINDOW IONOSUB	V RMS ALL NOSUB	XX PKS0023_026 INT NOSUB	V PKS0023_026 INT NOSUB	V R SUE
00	2	-10.65	0.11	0.61	3.28	126	1	3	0.21	0.18	0	0 0.00	0.00000028655	0.151	688.7	387933.6	293.64	11.02	51.85	6.76	5 51.81	6.76	0.0080	1.4983	0.0064	
00	2	-10.15	0.12	0.60	2.93	126	1	3	0.21	0.18	0	0 0.00	0.0000026697	0.150	700.3	385843.1	296.88	10.76	50.80	6.44	50.76	6.43	0.0080	1.5898	0.0091	
00	2	-9.62	0.12	0.58	2.88	126	1	3	0.21	0.18	0	0 0.00	0.0000025735	0.140	661.6	385476.2	299.75	10.32	49.40	6.04	49.38	6.04	0.0080	1.7059	0.0078	
00	2	-9.12	0.11	0.62	3.57	126	1	3	0.21	0.18	0	0 0.00	0.0000024620	0.113	660.5	384917.4	304.60	10.03	48.71	5.80	48.70	5.80	0.0080	1.7942	0.0063	
00	2	-8.61	0.10	0.62	3.50	126	1	3	0.21	0.18	0	0 0.00	0.0000023436	0.146	690.1	386191.0	308.51	9.68	47.84	5.50	47.84	5.50	0.0080	1.8968	0.0072	
00	2	-8.11	0.10	0.62	3.25	126	1	3	0.21	0.18	0	0 0.00	0.0000023300	0.092	685.3	385545.6	313.48	9.36	47.29	5.29	47.2	5.29	0.0080	1,9676	0.0077	
00	2	-7.58	0.10	0.63	3.76	126	1	3	3 0.21	0.18	0	0 0.00	0.00000021047	0.139	682.1	383193.9	317.86	9.00	46.39	4.97	46.34	4.96	0.0079	2.1134	0.0075	
00	2	-7.08	0.09	0.67	5.56	126	1	3	0.21	0.18	0	0 0.00	0.00000020297	0,113	676.0	383989.4	319.52	8.82	45,45	4.75	45.40	4.75	0.0079	2,1807	0.0070	
00	2	-6.58	0.09	0.68	5.48	126	1	3	0.21	0.18	0	0 0.00	0.00000019858	0.087	644.6	383466.1	320.27	8.61	44.92	4.56	44.88	4.55	0.0079	2.2851	0.0054	
00	2	-6.07	0.08	0.73	8.40	126	1	3	0.21	0.18	0	0 0.00	0.00000019141	0.104	652.3	382041.3	321.61	8.47	44.08	4.35	5 44.04	4.35	0.0079	2.3482	0.0072	
00	2	-5.54	0.08	0.76	10.00	126	1	3	0.21	0.18	0	0 0.00	0.00000016964	0.096	660.7	384578.9	323.67	8.39	43.91	4.22	43.8	4.22	0.0078	2,4209	0.0048	
00	2	-5.04	0.08	0.77	10.54	126	1	3	0.21	0.18	0	0 0.00	0.00000015966	0.129	695.3	382522.0	325.32	8.30	43.31	4.07	43.27	4.07	0.0079	2,4904	0.0068	
00	2	-4.54	0.09	0.80	12.27	126	1	3	0.21	0.18	0	0 0.00	0.00000016278	0.142	699.0	379319.8	325.16	8.24	43.20	3.96	43.17	3.96	0.0078	2.5635	0.0050	
00	2	-4.04	0.09	0.73	8.07	126	1	3	0.21	0.19	0	0 0.00	0.00000014802	0.153	701.0	380331.1	324.84	8.50	43.17	4.07	43.15	5 4.07	0.0079	2.6313	0.0066	
00	0	-3.00	0.09	0.75	9.32	127	1	3	0.20	0.18	0	1 0.16	0.00000017940	1.662	655.7	175551.5	321.40	14.57	63.53	10.83	63.49	10.83	0.0077	1.5704	0.0056	
00	0	-2.50	0.10	0.77	10.88	127	1	3	0.20	0.18	0	1 0.16	0.00000017756	1.693	668.8	170768.9	317.15	11.71	55.45	7.77	55.42	2 7.77	0.0077	1.6724	0.0052	
00	0	-2.00	0.10	0.76	10.35	127	1	3	0.20	0.18	0	1 0.16	0.00000016732	1.681	693.2	168316.7	318.31	11.31	54.01	7.30	53.99	7.29	0.0077	1.7765	0.0074	
00	0	-1.46	0.10	0.76	10.39	127	1	3	0.20	0.18	0	1 0.16	0.00000015568	1.688	684.9	172596.0	318.97	10.86	52.72	6.86	52.69	6.86	0.0077	1.8896	0.0054	
00	0	-0.96	0.10	0.77	10.85	127	1	3	0.20	0.18	0	1 0.16	0.00000016406	1.669	705.3	170333.6	319.45	10.50	51.45	6.53	51.42	6.53	0.0077	1.9886	0.0086	
00	0	-0.46	0.14	0.63	4.51	127	1	3	0.20	0.18	0	1 0.16	0.00000016338	1.677	672.5	169514.5	320.86	10.16	50.64	6,19	50.63	6.19	0.0078	2.0648	0.0076	
00	2	-11.17	0.14	0.68	7.12	127	1	3	0.20	0.18	0	C 0.00	0.00000028752	0.112	695.2	391845.5	300.80	11.47	54.18	7.31	54.17	7.31	0.0080	1.3925	0.0082	
00	2	-10.14	0.14	0.69	7.79	127	1	3	0.20	0.19	0	c 0.00	0.0000026938	0.106	738.5	390868.0	304.91	10.85	51.92	6.55	5 51.85	6.54	0.0080	1.6057	0.0074	
00	2	-9.63	0.13	0.68	6.84	127	1	3	3 0.20	0.18	0	c 0.00	0.00000024782	0.111	728.8	387887.0	307.80	10.44	50.96	6.21	50.93	6.21	0.0080	1.6814	0.0086	
00	2	-9.13	0.14	0.66	6.14	127	1	3	3 0.20	0.18	0	c 0.00	0.00000024006	0.139	681.0	386649.7	312.49	10.10	49.81	5.90	49.8	5.90	0.0080	1.8107	0.0063	
00	2	-8.60	0.14	0.62	4.14	127	1	3	0.20	0.18	0	c 0.00	0.0000023999	0.134	732.5	389761.9	316.04	9.73	48.94	5.61	48.93	5.61	0.0080	1,9039	0.0054	
00	2	-8.10	0.14	0.63	4.67	127	1	2	0.20	0.18	0	c 0.00	0.0000023701	0.111	713.8	387966.6	319.62	9.34	47.59	5.29	47.56	5.29	0.0080	1,9877	0.0073	
00	2	-7.60	0.13	0.60	3.40	127	1	3	0.20	0.18	0	c 0.00	0.00000022584	0.095	680.9	387050.8	325,46	9.12	47.32	5.08	47.23	5.08	0.0080	2.0857	0.0067	
00	2	-7.09	0.13	0.62	4.25	127	1	3	3 0.20	0.18	0	c 0.00	0.0000020099	0.090	673.1	386893.2	326.08	8.89	46.46	4.87	46.43	4.87	0.0080	2,1764	0.0067	
00	2	-6.56	0.13	0.60	3.32	127	1	3	0.20	0.18	0	c 0.00	0.0000020564	0.100	680.5	388257.8	328.97	8.70	45.46	4.61	45.50	4.61	0.0079	2.2624	0.0057	
00	2	-6.06	0.12	0.61	3.17	127	1	3	0.20	0.18	0	c 0.00	0.00000018648	0.131	684.8	386124.3	330.40	8.60	45.36	4.46	45.34	4.46	0.0079	2.3344	0.0060	
00	2	-5.56	0.12	0.58	2.95	127	1	3	0.20	0.18	0	c 0.00	0.00000016678	0,135	677.2	386590.8	333.51	8.52	44.91	4.31	44.86	4.31	0.0079	2.4280	0.0053	
00	2	-5.06	0.12	0.59	2.99	127	1	3	0.20	0.18	0	c 0.00	0.00000017063	0.079	690.8	384709.7	334.06	8.48	44.72	4.21	44.73	4.21	0.0078	2.4914	0.0072	
00	2	-4.52	0.12	0.60	3.14	127	1	3	0.20	0.18	0	c 0.00	0.00000014957	0.086	719.3	383409.0	336.58	8.50	44.82	4.13	44.78	4.13	0.0079	2.5752	0.0071	
00	2	-4.02	0.14	0.72	9.10	127	1	3	0.20	0.18	0	c 0.00	0.00000015689	0.112	716.2	383831.6	332.86	8.49	43.79	4.03	43.74	4.03	0.0078	2.6148	0.0064	
00	0	-3.02	0.15	0.73	9.66	127	1	3	0.20	0.18	0	1 0.16	0.00000017676	1.678	684.0	174991.7	315.68	11.51	55.96	7.66	55.95	5 7.66	0.0079	1.5740	0.0069	
00	0	-2.48	0.15	0.75	10.76	127	1	3	0.21	0.20	0	1 0.16	0.00000017938	1.703	686.2	172630.8	316.92	11.36	55.05	7.41	55.03	3 7.41	0.0079	1.6850	0.0077	
00	0	-1.98	0.07	0.59	1.79	127	1	3	0.20	0.18	0	1 0.16	0.00000017240	1.666	719.0	172415.7	317.58	11.15	54.24	7.14	54.22	2 7.14	0.0079	1.7748	0.0057	
00	2	-11.18	0.07	0.59	1.69	127	1	3	0.20	0.18	1	0 0.00	0.00000024487	0.815	659.3	392146.5	292.56	11.20	52.95	7.03	52.93	3 7.03	0.0080	1.3879	0.0080	
00	2	-10.64	0.07	0.60	1.72	127	1	3	0.20	0.18	1	0 0.00	0.0000024954	0.820	681.5	391858.1	293.78	10.87	51.54	6.61	51.50	6.61	0.0079	1.5033	0.0084	
00	2	-10.14	0.07	0.61	2.22	127	1	3	0.20	0.19	1	0 0.00	0.0000024035	0.839	671.1	390600.E	288.15	10.30	48.81	6.11	48.77	6.11	0.0080	1.5986	0.0086	
00	2	-9.64	0.07	0.59	1.65	127	1	3	0.20	0.19	1	0 0.00	0.0000023178	0.826	671.6	388904.8	299.92	10.18	49.51	5.96	49.49	5.96	0.0080	1.7139	0.0066	
00	2	-9.14	0.06	0.62	2.32	127	1	3	0.20	0.18	1	0 0.00	0.0000021044	0.827	667.8	388209.1	300.88	9.76	47.75	5.59	47.7	5.59	0.0079	1.7912	0.0075	
00	2	-8.60	0.06	0.57	1.58	127	1	3	0.20	0.18	1	0 0.00	0.0000023272	0.777	678.4	387987.4	305.71	9.39	46.83	5.33	46.8	5.33	0.0079	1.8932	0.0073	
00	2	-8.10	0.06	0.58	1.55	127	1	3	0.20	0.18	1	0 0.00	0.00000019176	0.803	696.9	390305.9	311.79	9.26	46.77	5.25	5 46.73	5.24	0.0079	2.0127	0.0051	
00	2	-7.60	0.07	0.59	1.65	127	1	3	0.20	0.19	1	0 0.00	0.0000020563	0.845	645.4	388032.9	309.67	8.72	44.94	4.81	44.92	4.81	0.0080	2.0894	0.0083	
00	2	-7.10	0.07	0.58	1.70	127	1	3	0.20	0.19	1	0 0.00	0.0000018860	0.811	675.8	388066.1	326.50	9.06	47.49	4.94	47.47	4.94	0.0079	2.1699	0.0084	
00	2	-6.57	0.07	0.56	1.75	127	1	3	0.20	0.18	1	0 0.00	0.00000017947	0.810	636.0	388037.8	318.31	8.54	44.66	4.54	44.67	4.54	0.0079	2.2780	0.0065	
		0.00	0.07	0.00		107				0.40		0 0 00	0.00000040400	0 777		000050	000.00	0.00		4.00		1.00	0.0070	0.0454	0.0055	

Capturing quality metrics directly via Google API

14 COMPLETED STUDENT THESES!





mwa_hyperdrive documentation

Introduction



mwa_hyperdrive (simply referred to as hyperdrive) is calibration software for the Murchison Widefield Array radio telescope. The documentation contained in this book aims to help understand how to use it and how it works.

Hyperdrive: ASTRO3D's new open-access calibration software suitable for all MWA uses





MWA metadata and quality metrics (for EoR)





Congratulations to Dr. Nichole Barry on the joint win of the ASA's Louise Webster Prize for her 2019 paper Improving the Epoch of Reionization Power Spectrum Results from MWA Season 1 Observations





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E	SWEET	LST WRAP	HYP IONO MAG	HYP IONO PCA	HYP IONO QA	DB GOOD TILES	DB FLAG TILES	WS N DEAD DIPS	TOTAL FLAG	NON	N PREP N CA	L NON CONVG	CAL RMS CONVG	CAL SKEW	CAL RECV VAR	CAL DFFT POW	P_WEDGE NOSUB	P_WINDOW NOSUB	P_WEDGE SUB	P_WINDOW SUB	P_WEDGE IONOSUB	P_WINDOW IONOSUB	V RMS ALL NOSUB	XX PKS0023_026 INT NOSUB	V PKS0023_026 INT NOSUB	V R SUE
00	2	-10.65	0.11	0.61	3.28	126	1	3	0.21	0.18	0	0 0.00	0.00000028655	0.151	688.7	387933.6	293.64	11.02	51.85	6.76	5 51.81	6.76	0.0080	1.4983	0.0064	
00	2	-10.15	0.12	0.60	2.93	126	1	3	0.21	0.18	0	0 0.00	0.0000026697	0.150	700.3	385843.1	296.88	10.76	50.80	6.44	50.76	6.43	0.0080	1.5898	0.0091	
00	2	-9.62	0.12	0.58	2.88	126	1	3	0.21	0.18	0	0 0.00	0.0000025735	0.140	661.6	385476.2	299.75	10.32	49.40	6.04	49.38	6.04	0.0080	1.7059	0.0078	
00	2	-9.12	0.11	0.62	3.57	126	1	3	0.21	0.18	0	0 0.00	0.0000024620	0.113	660.5	384917.4	304.60	10.03	48.71	5.80	48.70	5.80	0.0080	1.7942	0.0063	
00	2	-8.61	0.10	0.62	3.50	126	1	3	0.21	0.18	0	0 0.00	0.0000023436	0.146	690.1	386191.0	308.51	9.68	47.84	5.50	47.84	5.50	0.0080	1.8968	0.0072	
00	2	-8.11	0.10	0.62	3.25	126	1	3	0.21	0.18	0	0 0.00	0.0000023300	0.092	685.3	385545.6	313.48	9.36	47.29	5.29	47.2	5.29	0.0080	1,9676	0.0077	
00	2	-7.58	0.10	0.63	3.76	126	1	3	3 0.21	0.18	0	0 0.00	0.00000021047	0.139	682.1	383193.9	317.86	9.00	46.39	4.97	46.34	4.96	0.0079	2.1134	0.0075	
00	2	-7.08	0.09	0.67	5.56	126	1	3	0.21	0.18	0	0 0.00	0.00000020297	0,113	676.0	383989.4	319.52	8.82	45,45	4.75	45.40	4.75	0.0079	2,1807	0.0070	
00	2	-6.58	0.09	0.68	5.48	126	1	3	0.21	0.18	0	0 0.00	0.00000019858	0.087	644.6	383466.1	320.27	8.61	44.92	4.56	44.88	4.55	0.0079	2.2851	0.0054	
00	2	-6.07	0.08	0.73	8.40	126	1	3	0.21	0.18	0	0 0.00	0.00000019141	0.104	652.3	382041.3	321.61	8.47	44.08	4.35	5 44.04	4.35	0.0079	2.3482	0.0072	
00	2	-5.54	0.08	0.76	10.00	126	1	3	0.21	0.18	0	0 0.00	0.00000016964	0.096	660.7	384578.9	323.67	8.39	43.91	4.22	43.8	4.22	0.0078	2,4209	0.0048	
00	2	-5.04	0.08	0.77	10.54	126	1	3	0.21	0.18	0	0 0.00	0.00000015966	0.129	695.3	382522.0	325.32	8.30	43.31	4.07	43.27	4.07	0.0079	2,4904	0.0068	
00	2	-4.54	0.09	0.80	12.27	126	1	3	0.21	0.18	0	0 0.00	0.00000016278	0.142	699.0	379319.8	325.16	8.24	43.20	3.96	43.17	3.96	0.0078	2.5635	0.0050	
00	2	-4.04	0.09	0.73	8.07	126	1	3	0.21	0.19	0	0 0.00	0.00000014802	0.153	701.0	380331.1	324.84	8.50	43.17	4.07	43.15	5 4.07	0.0079	2.6313	0.0066	
00	0	-3.00	0.09	0.75	9.32	127	1	3	0.20	0.18	0	1 0.16	0.00000017940	1.662	655.7	175551.5	321.40	14.57	63.53	10.83	63.49	10.83	0.0077	1.5704	0.0056	
00	0	-2.50	0.10	0.77	10.88	127	1	3	0.20	0.18	0	1 0.16	0.00000017756	1.693	668.8	170768.9	317.15	11.71	55.45	7.77	55.42	2 7.77	0.0077	1.6724	0.0052	
00	0	-2.00	0.10	0.76	10.35	127	1	3	0.20	0.18	0	1 0.16	0.00000016732	1.681	693.2	168316.7	318.31	11.31	54.01	7.30	53.99	7.29	0.0077	1.7765	0.0074	
00	0	-1.46	0.10	0.76	10.39	127	1	3	0.20	0.18	0	1 0.16	0.00000015568	1.688	684.9	172596.0	318.97	10.86	52.72	6.86	52.69	6.86	0.0077	1.8896	0.0054	
00	0	-0.96	0.10	0.77	10.85	127	1	3	0.20	0.18	0	1 0.16	0.00000016406	1.669	705.3	170333.6	319.45	10.50	51.45	6.53	51.42	6.53	0.0077	1.9886	0.0086	
00	0	-0.46	0.14	0.63	4.51	127	1	3	0.20	0.18	0	1 0.16	0.00000016338	1.677	672.5	169514.5	320.86	10.16	50.64	6,19	50.63	6.19	0.0078	2.0648	0.0076	
00	2	-11.17	0.14	0.68	7.12	127	1	3	0.20	0.18	0	C 0.00	0.00000028752	0.112	695.2	391845.5	300.80	11.47	54.18	7.31	54.17	7.31	0.0080	1,3925	0.0082	
00	2	-10.14	0.14	0.69	7.79	127	1	3	0.20	0.19	0	c 0.00	0.0000026938	0.106	738.5	390868.0	304.91	10.85	51.92	6.55	5 51.85	6.54	0.0080	1.6057	0.0074	
00	2	-9.63	0.13	0.68	6.84	127	1	3	3 0.20	0.18	0	c 0.00	0.00000024782	0.111	728.8	387887.0	307.80	10.44	50.96	6.21	50.93	6.21	0.0080	1.6814	0.0086	
00	2	-9.13	0.14	0.66	6.14	127	1	3	3 0.20	0.18	0	c 0.00	0.00000024006	0.139	681.0	386649.7	312.49	10.10	49.81	5.90	49.8	5.90	0.0080	1.8107	0.0063	
00	2	-8.60	0.14	0.62	4.14	127	1	3	0.20	0.18	0	c 0.00	0.0000023999	0.134	732.5	389761.9	316.04	9.73	48.94	5.61	48.93	5.61	0.0080	1,9039	0.0054	
00	2	-8.10	0.14	0.63	4.67	127	1	2	0.20	0.18	0	c 0.00	0.0000023701	0.111	713.8	387966.6	319.62	9.34	47.59	5.29	47.56	5.29	0.0080	1,9877	0.0073	
00	2	-7.60	0.13	0.60	3.40	127	1	3	0.20	0.18	0	c 0.00	0.00000022584	0.095	680.9	387050.8	325,46	9.12	47.32	5.08	47.23	5.08	0.0080	2.0857	0.0067	
00	2	-7.09	0.13	0.62	4.25	127	1	3	3 0.20	0.18	0	c 0.00	0.0000020099	0.090	673.1	386893.2	326.08	8.89	46.46	4.87	46.43	4.87	0.0080	2,1764	0.0067	
00	2	-6.56	0.13	0.60	3.32	127	1	3	0.20	0.18	0	c 0.00	0.0000020564	0.100	680.5	388257.8	328.97	8.70	45.46	4.61	45.50	4.61	0.0079	2.2624	0.0057	
00	2	-6.06	0.12	0.61	3.17	127	1	3	0.20	0.18	0	c 0.00	0.00000018648	0.131	684.8	386124.3	330.40	8.60	45.36	4.46	45.34	4.46	0.0079	2.3344	0.0060	
00	2	-5.56	0.12	0.58	2.95	127	1	3	0.20	0.18	0	c 0.00	0.00000016678	0,135	677.2	386590.8	333.51	8.52	44.91	4.31	44.86	4.31	0.0079	2.4280	0.0053	
00	2	-5.06	0.12	0.59	2.99	127	1	3	0.20	0.18	0	c 0.00	0.00000017063	0.079	690.8	384709.7	334.06	8.48	44.72	4.21	44.73	4.21	0.0078	2.4914	0.0072	
00	2	-4.52	0.12	0.60	3.14	127	1	3	0.20	0.18	0	c 0.00	0.00000014957	0.086	719.3	383409.0	336.58	8.50	44.82	4.13	44.78	4.13	0.0079	2.5752	0.0071	
00	2	-4.02	0.14	0.72	9.10	127	1	3	0.20	0.18	0	c 0.00	0.00000015689	0.112	716.2	383831.6	332.86	8.49	43.79	4.03	43.74	4.03	0.0078	2.6148	0.0064	
00	0	-3.02	0.15	0.73	9.66	127	1	3	0.20	0.18	0	1 0.16	0.00000017676	1.678	684.0	174991.7	315.68	11.51	55.96	7.66	55.95	5 7.66	0.0079	1.5740	0.0069	
00	0	-2.48	0.15	0.75	10.76	127	1	3	0.21	0.20	0	1 0.16	0.00000017938	1.703	686.2	172630.8	316.92	11.36	55.05	7.41	55.03	3 7.41	0.0079	1.6850	0.0077	
00	0	-1.98	0.07	0.59	1.79	127	1	3	0.20	0.18	0	1 0.16	0.00000017240	1.666	719.0	172415.7	317.58	11.15	54.24	7.14	54.22	2 7.14	0.0079	1.7748	0.0057	
00	2	-11.18	0.07	0.59	1.69	127	1	3	0.20	0.18	1	0 0.00	0.00000024487	0.815	659.3	392146.5	292.56	11.20	52.95	7.03	52.93	3 7.03	0.0080	1.3879	0.0080	
00	2	-10.64	0.07	0.60	1.72	127	1	3	0.20	0.18	1	0 0.00	0.0000024954	0.820	681.5	391858.1	293.78	10.87	51.54	6.61	51.50	6.61	0.0079	1.5033	0.0084	
00	2	-10.14	0.07	0.61	2.22	127	1	3	0.20	0.19	1	0 0.00	0.0000024035	0.839	671.1	390600.E	288.15	10.30	48.81	6.11	48.77	6.11	0.0080	1.5986	0.0086	
00	2	-9.64	0.07	0.59	1.65	127	1	3	0.20	0.19	1	0 0.00	0.0000023178	0.826	671.6	388904.8	299.92	10.18	49.51	5.96	49.49	5.96	0.0080	1.7139	0.0066	
00	2	-9.14	0.06	0.62	2.32	127	1	3	0.20	0.18	1	0 0.00	0.0000021044	0.827	667.8	388209.1	300.88	9.76	47.75	5.59	47.7	5.59	0.0079	1.7912	0.0075	
00	2	-8.60	0.06	0.57	1.58	127	1	3	0.20	0.18	1	0 0.00	0.0000023272	0.777	678.4	387987.4	305.71	9.39	46.83	5.33	46.8	5.33	0.0079	1.8932	0.0073	
00	2	-8.10	0.06	0.58	1.55	127	1	3	0.20	0.18	1	0 0.00	0.00000019176	0.803	696.9	390305.9	311.79	9.26	46.77	5.25	5 46.73	5.24	0.0079	2.0127	0.0051	
00	2	-7.60	0.07	0.59	1.65	127	1	3	0.20	0.19	1	0 0.00	0.0000020563	0.845	645.4	388032.9	309.67	8.72	44.94	4.81	44.92	4.81	0.0080	2.0894	0.0083	
00	2	-7.10	0.07	0.58	1.70	127	1	3	0.20	0.19	1	0 0.00	0.0000018860	0.811	675.8	388066.1	326.50	9.06	47.49	4.94	47.47	4.94	0.0079	2.1699	0.0084	
00	2	-6.57	0.07	0.56	1.75	127	1	3	0.20	0.18	1	0 0.00	0.00000017947	0.810	636.0	388037.8	318.31	8.54	44.66	4.54	44.67	4.54	0.0079	2.2780	0.0065	
		0.00	0.07	0.00		107				0.40		0 0 00	0.00000040400	0 777		000050	000.00	0.00		4.00		1.00	0.0070	0.0454	0.0055	

Capturing quality metrics directly via Google API

14 COMPLETED STUDENT THESES!





mwa_hyperdrive documentation

Introduction



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Hyperdrive: ASTRO3D's new open-access calibration software suitable for all MWA uses



Tune in to Wednesday's EoR session for more news!



MWA metadata and quality metrics (for EoR)





Congratulations to Dr. Nichole Barry on the joint win of the ASA's Louise Webster Prize for her 2019 paper Improving the Epoch of Reionization Power Spectrum Results from MWA Season 1 Observations





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E	SWEET	LST WRAP	HYP IONO MAG	HYP IONO PCA	HYP IONO QA	DB GOOD TILES	DB FLAG TILES	WS N DEAD DIPS	TOTAL FLAG	NON	N PREP N CA	L NON CONVG	CAL RMS CONVG	CAL SKEW	CAL RECV VAR	CAL DFFT POW	P_WEDGE NOSUB	P_WINDOW NOSUB	P_WEDGE SUB	P_WINDOW SUB	P_WEDGE IONOSUB	P_WINDOW IONOSUB	V RMS ALL NOSUB	XX PKS0023_026 INT NOSUB	V PKS0023_026 INT NOSUB	V R SUE
00	2	-10.65	0.11	0.61	3.28	126	1	3	0.21	0.18	0	0 0.00	0.00000028655	0.151	688.7	387933.6	293.64	11.02	51.85	6.76	5 51.81	6.76	0.0080	1.4983	0.0064	
00	2	-10.15	0.12	0.60	2.93	126	1	3	0.21	0.18	0	0 0.00	0.0000026697	0.150	700.3	385843.1	296.88	10.76	50.80	6.44	50.76	6.43	0.0080	1.5898	0.0091	
00	2	-9.62	0.12	0.58	2.88	126	1	3	0.21	0.18	0	0 0.00	0.0000025735	0.140	661.6	385476.2	299.75	10.32	49.40	6.04	49.38	6.04	0.0080	1.7059	0.0078	
00	2	-9.12	0.11	0.62	3.57	126	1	3	0.21	0.18	0	0 0.00	0.0000024620	0.113	660.5	384917.4	304.60	10.03	48.71	5.80	48.70	5.80	0.0080	1.7942	0.0063	
00	2	-8.61	0.10	0.62	3.50	126	1	3	0.21	0.18	0	0 0.00	0.0000023436	0.146	690.1	386191.0	308.51	9.68	47.84	5.50	47.84	5.50	0.0080	1.8968	0.0072	
00	2	-8.11	0.10	0.62	3.25	126	1	3	0.21	0.18	0	0 0.00	0.0000023300	0.092	685.3	385545.6	313.48	9.36	47.29	5.29	47.2	5.29	0.0080	1,9676	0.0077	
00	2	-7.58	0.10	0.63	3.76	126	1	3	0.21	0.18	0	0 0.00	0.00000021047	0.139	682.1	383193.9	317.86	9.00	46.39	4.97	46.34	4.96	0.0079	2.1134	0.0075	
00	2	-7.08	0.09	0.67	5.56	126	1	3	0.21	0.18	0	0 0.00	0.00000020297	0,113	676.0	383989.4	319.52	8.82	45,45	4.75	45.40	4.75	0.0079	2,1807	0.0070	
00	2	-6.58	0.09	0.68	5.48	126	1	3	0.21	0.18	0	0 0.00	0.00000019858	0.087	644.6	383466.1	320.27	8.61	44.92	4.56	44.88	4.55	0.0079	2.2851	0.0054	
00	2	-6.07	0.08	0.73	8.40	126	1	3	0.21	0.18	0	0 0.00	0.00000019141	0.104	652.3	382041.3	321.61	8.47	44.08	4.35	5 44.04	4.35	0.0079	2.3482	0.0072	
00	2	-5.54	0.08	0.76	10.00	126	1	3	0.21	0.18	0	0 0.00	0.00000016964	0.096	660.7	384578.9	323.67	8.39	43.91	4.22	43.8	4.22	0.0078	2,4209	0.0048	
00	2	-5.04	0.08	0.77	10.54	126	1	3	0.21	0.18	0	0 0.00	0.00000015966	0.129	695.3	382522.0	325.32	8.30	43.31	4.07	43.27	4.07	0.0079	2,4904	0.0068	
00	2	-4.54	0.09	0.80	12.27	126	1	3	0.21	0.18	0	0 0.00	0.00000016278	0.142	699.0	379319.8	325.16	8.24	43.20	3.96	43.17	3.96	0.0078	2.5635	0.0050	
00	2	-4.04	0.09	0.73	8.07	126	1	3	0.21	0.19	0	0 0.00	0.00000014802	0.153	701.0	380331.1	324.84	8.50	43.17	4.07	43.15	5 4.07	0.0079	2.6313	0.0066	
00	0	-3.00	0.09	0.75	9.32	127	1	3	0.20	0.18	0	1 0.16	0.00000017940	1.662	655.7	175551.5	321.40	14.57	63.53	10.83	63.49	10.83	0.0077	1.5704	0.0056	
00	0	-2.50	0.10	0.77	10.88	127	1	3	0.20	0.18	0	1 0.16	0.00000017756	1.693	668.8	170768.9	317.15	11.71	55.45	7.77	55.42	2 7.77	0.0077	1.6724	0.0052	
00	0	-2.00	0.10	0.76	10.35	127	1	3	0.20	0.18	0	1 0.16	0.00000016732	1.681	693.2	168316.7	318.31	11.31	54.01	7.30	53.99	7.29	0.0077	1.7765	0.0074	
00	0	-1.46	0.10	0.76	10.39	127	1	3	0.20	0.18	0	1 0.16	0.00000015568	1.688	684.9	172596.0	318.97	10.86	52.72	6.86	52.69	6.86	0.0077	1.8896	0.0054	
00	0	-0.96	0.10	0.77	10.85	127	1	3	0.20	0.18	0	1 0.16	0.00000016406	1.669	705.3	170333.6	319.45	10.50	51.45	6.53	51.42	6.53	0.0077	1.9886	0.0086	
00	0	-0.46	0.14	0.63	4.51	127	1	3	0.20	0.18	0	1 0.16	0.00000016338	1.677	672.5	169514.5	320.86	10.16	50.64	6,19	50.63	6.19	0.0078	2.0648	0.0076	
00	2	-11.17	0.14	0.68	7.12	127	1	3	0.20	0.18	0	C 0.00	0.00000028752	0.112	695.2	391845.5	300.80	11.47	54.18	7.31	54.17	7.31	0.0080	1,3925	0.0082	
00	2	-10.14	0.14	0.69	7.79	127	1	3	0.20	0.19	0	c 0.00	0.0000026938	0.106	738.5	390868.0	304.91	10.85	51.92	6.55	5 51.85	6.54	0.0080	1.6057	0.0074	
00	2	-9.63	0.13	0.68	6.84	127	1	3	3 0.20	0.18	0	c 0.00	0.00000024782	0.111	728.8	387887.0	307.80	10.44	50.96	6.21	50.93	6.21	0.0080	1.6814	0.0086	
00	2	-9.13	0.14	0.66	6.14	127	1	3	3 0.20	0.18	0	c 0.00	0.00000024006	0.139	681.0	386649.7	312.49	10.10	49.81	5.90	49.8	5.90	0.0080	1.8107	0.0063	
00	2	-8.60	0.14	0.62	4.14	127	1	3	0.20	0.18	0	c 0.00	0.0000023999	0.134	732.5	389761.9	316.04	9.73	48.94	5.61	48.93	5.61	0.0080	1,9039	0.0054	
00	2	-8.10	0.14	0.63	4.67	127	1	2	0.20	0.18	0	c 0.00	0.0000023701	0.111	713.8	387966.6	319.62	9.34	47.59	5.29	47.56	5.29	0.0080	1,9877	0.0073	
00	2	-7.60	0.13	0.60	3.40	127	1	3	0.20	0.18	0	c 0.00	0.00000022584	0.095	680.9	387050.8	325,46	9.12	47.32	5.08	47.23	5.08	0.0080	2.0857	0.0067	
00	2	-7.09	0.13	0.62	4.25	127	1	3	3 0.20	0.18	0	c 0.00	0.0000020099	0.090	673.1	386893.2	326.08	8.89	46.46	4.87	46.43	4.87	0.0080	2,1764	0.0067	
00	2	-6.56	0.13	0.60	3.32	127	1	3	0.20	0.18	0	c 0.00	0.0000020564	0.100	680.5	388257.8	328.97	8.70	45.46	4.61	45.50	4.61	0.0079	2.2624	0.0057	
00	2	-6.06	0.12	0.61	3.17	127	1	3	0.20	0.18	0	c 0.00	0.00000018648	0.131	684.8	386124.3	330.40	8.60	45.36	4.46	45.34	4.46	0.0079	2.3344	0.0060	
00	2	-5.56	0.12	0.58	2.95	127	1	3	0.20	0.18	0	c 0.00	0.00000016678	0,135	677.2	386590.8	333.51	8.52	44.91	4.31	44.86	4.31	0.0079	2.4280	0.0053	
00	2	-5.06	0.12	0.59	2.99	127	1	3	0.20	0.18	0	c 0.00	0.00000017063	0.079	690.8	384709.7	334.06	8.48	44.72	4.21	44.73	4.21	0.0078	2.4914	0.0072	
00	2	-4.52	0.12	0.60	3.14	127	1	3	0.20	0.18	0	c 0.00	0.00000014957	0.086	719.3	383409.0	336.58	8.50	44.82	4.13	44.78	4.13	0.0079	2.5752	0.0071	
00	2	-4.02	0.14	0.72	9.10	127	1	3	0.20	0.18	0	c 0.00	0.00000015689	0.112	716.2	383831.6	332.86	8.49	43.79	4.03	43.74	4.03	0.0078	2.6148	0.0064	
00	0	-3.02	0.15	0.73	9.66	127	1	3	0.20	0.18	0	1 0.16	0.00000017676	1.678	684.0	174991.7	315.68	11.51	55.96	7.66	55.95	5 7.66	0.0079	1.5740	0.0069	
00	0	-2.48	0.15	0.75	10.76	127	1	3	0.21	0.20	0	1 0.16	0.00000017938	1.703	686.2	172630.8	316.92	11.36	55.05	7.41	55.03	3 7.41	0.0079	1.6850	0.0077	
00	0	-1.98	0.07	0.59	1.79	127	1	3	0.20	0.18	0	1 0.16	0.00000017240	1.666	719.0	172415.7	317.58	11.15	54.24	7.14	54.22	2 7.14	0.0079	1.7748	0.0057	
00	2	-11.18	0.07	0.59	1.69	127	1	3	0.20	0.18	1	0 0.00	0.00000024487	0.815	659.3	392146.5	292.56	11.20	52.95	7.03	52.93	3 7.03	0.0080	1.3879	0.0080	
00	2	-10.64	0.07	0.60	1.72	127	1	3	0.20	0.18	1	0 0.00	0.0000024954	0.820	681.5	391858.1	293.78	10.87	51.54	6.61	51.50	6.61	0.0079	1.5033	0.0084	
00	2	-10.14	0.07	0.61	2.22	127	1	3	0.20	0.19	1	0 0.00	0.0000024035	0.839	671.1	390600.E	288.15	10.30	48.81	6.11	48.77	6.11	0.0080	1.5986	0.0086	
00	2	-9.64	0.07	0.59	1.65	127	1	3	0.20	0.19	1	0 0.00	0.0000023178	0.826	671.6	388904.8	299.92	10.18	49.51	5.96	49.49	5.96	0.0080	1.7139	0.0066	
00	2	-9.14	0.06	0.62	2.32	127	1	3	0.20	0.18	1	0 0.00	0.0000021044	0.827	667.8	388209.1	300.88	9.76	47.75	5.59	47.7	5.59	0.0079	1.7912	0.0075	
00	2	-8.60	0.06	0.57	1.58	127	1	3	0.20	0.18	1	0 0.00	0.0000023272	0.777	678.4	387987.4	305.71	9.39	46.83	5.33	46.8	5.33	0.0079	1.8932	0.0073	
00	2	-8.10	0.06	0.58	1.55	127	1	3	0.20	0.18	1	0 0.00	0.00000019176	0.803	696.9	390305.9	311.79	9.26	46.77	5.25	5 46.73	5.24	0.0079	2.0127	0.0051	
00	2	-7.60	0.07	0.59	1.65	127	1	3	0.20	0.19	1	0 0.00	0.0000020563	0.845	645.4	388032.9	309.67	8.72	44.94	4.81	44.92	4.81	0.0080	2.0894	0.0083	
00	2	-7.10	0.07	0.58	1.70	127	1	3	0.20	0.19	1	0 0.00	0.0000018860	0.811	675.8	388066.1	326.50	9.06	47.49	4.94	47.47	4.94	0.0079	2.1699	0.0084	
00	2	-6.57	0.07	0.56	1.75	127	1	3	0.20	0.18	1	0 0.00	0.00000017947	0.810	636.0	388037.8	318.31	8.54	44.66	4.54	44.67	4.54	0.0079	2.2780	0.0065	
		0.00	0.07	0.00		107				0.40		0 0 00	0.00000040400	0 777	057 4	000050	000.00	0.00		4.00		1.00	0.0070	0.0454	0.0055	

Capturing quality metrics directly via Google API

14 COMPLETED STUDENT THESES!





HIGHLIGHTS: PFT & TRANSIENTS

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SMART Pulsar Survey:

- Papers I and II published in PASA
- So far: 177 detections; three **new discoveries**

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m-mahlhim



m-whilly





redit:	Daniel	López/
eles	cope—	Credit:
ict A	rray–	-Credit:
XM	M-Nev	vton—



redit:	Daniel	López/
eles	cope—	Credit:
ict A	rray–	-Credit:
XM	M-Nev	vton—



redit:	Daniel	López/
eles	cope—	Credit:
ict A	rray–	-Credit:
XM	M-Nev	vton—



redit:	Daniel	López/
eles	cope—	Credit:
ict A	rray–	-Credit:
XM	M-Nev	vton—





Morgan et al. 2023









CME detection and characterisation via IPS

- Unprecedented detail!
- **33 hours** after launch, **33 degrees** from the Sun!
- One single 5-minute MWA observation



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- WINQSE

► Machine learning for Solar physics

(Weak Impulsive Narrowband Quiet Sun Emission) Detecting & grouping by common properties for further study.







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FIVE COMPLETED STUDENT THESES!

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Machine learning for Solar physics

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- further study.



Dokara et al. 2023



Supernova remnant searches in MW

- Searching for the missing 600
- Multi-wavelength approach: MWA, VLA and Effelsberg
- SED characterisation

Dokara et al. 2023



Dokara et al. 2023





Dokara et al. 2023











GALAXY CLUSTERS!

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Duchesne et al. 2023 in prep.



Riseley et al. 2023 in prep.

GALAXY CLUSTERS!

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GALAXY CLUSTERS!



GALAXY CLUSTERS!



\${YOUR_SCIENCE_HERE}

GALAXY CLUSTERS!

Riseley et al. 2023 in prep.

Duchesne et al. 2023 in prep.

Abel101194 Abell 3667

\${YOUR_SCIENCE_HERE}

\${YOUR_SCIENCE_HERE_2}









GALAXY CLUSTERS!

Riseley et al. 2023 in prep.

Duchesne et al. 2023 in prep.

Abel101194 Abell 3667

\${YOUR_SCIENCE_HERE}

\${YOUR_SCIENCE_HERE_2}

GALACTIC PLANE!





GC This: Phase I (*Phase I + II: Student Project: S. Mantovanini*)

MWA PHASE III ENABLES THIS BY DEFAULT!





We acknowledge the Wajarri Yamatji people as the traditional owners of the Murchison Radioastronomy Observatory site. This work was supported by the Pawsey Supercomputing Centre. Support for the MWA and the Pawsey Centre are provided by both the Australian Government and Government of Western Australia.



► Papers:

- Passed 14k citations in the last six months!
- Who submitted our 300th paper? Surajit Mondal!

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- Attend the rest of the meeting to get all the details from the folks doing the work!

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• Recognition for those who make the MWA the success that it is: prizes and accepted theses.

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E: <u>scientist@mwatelescope.org</u>





@cjriseley 💟 @mwatelescope

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@cjriseley @mwatelescope

Thanks for listening. Questions?

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MWA QUIZ...



Respond at PollEv.com/chrisriseley676

Which MWA channel [frequency] does the beam pattern represent?





Chan235 [300 MHz]

Chan169 [216 MHz]

Chan145 [185 MHz]

Chan121 [154 MHz]

Chan093 [119 MHz]

Chan069 [88 MHz]