PROJECT “W” PHASE II

SECOND JUMP

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WHAT IS PROJECT “W”

- Myself and others have observed over time while wandering wormhole space in the New Eden cluster, that there seems to be some pattern to the “randomness” of wormhole connections. Project “W” was created to collect observational data while navigating wormhole connections.
- From April of yc118 to the end of June yc118 (2016), Phase I observations were collected which included information about the originating system, the signature connection, and the destination.
- This was intended to be an initial study to determine if further investigation and data collection was warranted should any anomalies be found.
- The null hypothesis is: Based on region, wormholes should be randomly connecting to other regions of space within the known expected distribution by type to the destination region using a significance level of 0.05

PHASE I RESULTS

- Using a connection that leads to High Sec, the expected probability of landing in Genesis was 3%. Based on observed data, Genesis was 20%. (9 out of 45).
- Using a connection that leads to High Sec, the expected probability of landing in Molden Heath was 1%. Based on observed data, Molden Heath was 9%. (4 out of 45).
- Together, both Genesis and Molden Heath accounted for 29% of jumps to High Sec.
- Using a connection that leads to Class 5 wormhole space, the expected probability of landing in E-R00024 was 4%. Based on observed data, E-R00024 was 19%. (4 out of 21).

PHASE I CONCLUSIONS

- To positively confirm these results, we need to meet the minimum conditions for the Chi-Square Goodness of Fit test of at least 5 observations per region in High Sec and Class 5 wormholes. More data is needed.
- The p-value results for both High Sec and Class 5 are way out of sync with the reminder of the findings, it seems unlikely the rejected result of the null hypothesis would be reversed with more data, but it is possible.
- Even allowing for the minimum conditions of the Chi-Square test not being met, there seems to be enough data to say something odd is going on Genesis, Molden Heath, and E-R00024.
- If we assume that more data will positively confirm these results, then the majority of known wormhole type connections are equally random across their respective destinations, with the exception of our 3 mysterious regions.
- We know there's something special about the Genesis region, the location of the EvE Gate. E-R00024 is home to the shattered system J013146 with the Talocan Static Gates and sleepers. What about Molden Heath?

PHASE II COLLECTION EFFORTS

- Data collected from September of yc118 to the end of November yc118 (2016)
  - Total of 15,305 connections observed
  - 4,902 connections via known wormhole types which will be used for the analysis
- All conditions met for the Chi-Square Goodness of Fit test
  - Good statistical method for categorized data to assess if the observed distribution is a good fit to the expected distribution.
  - Appropriate test when the following conditions are met:
    - Sampling method is simple random sampling. Our observed connections are equally likely to occur in our expected destination population (Regions). Passed.
    - Our variable under study (connection type) is categorical (Regions). Passed.
    - The expected value of the number of sample connections in each level of the variable is at least 5. Passed.

DETERMINING THE EXPECTED REVIEW

- Knowing the signature type, we know the space the destination resides in. For example, a signature type of E004 connects to a Class 1 wormhole.
- We know classes of wormholes contain specific regions. Sticking with our Class 1 wormhole, that would be Regions 1, 2, 3, and A-R00001.
- There are a total of 358 systems in Class 1 wormhole space. The expected chance of landing in a specific region will be determined by the number of systems in each region divided by the total number of systems for that class.

Class	Region	Systems	Expected
Class 1	Region 1	133	37.2%
	Region 2	153	42.7%
	Region 3	62	17.3%
	A-R00001	10	2.8%
		358	100.0%

K-SPACE EXPECTED DISTRIBUTION BY SEC/REGION

A641 | B274 | B449 | B520 | D792 | D845 | N110 | Q063 | S047

High Sec	Systems	Expected
Aridia	5	0.5%
Black Rise	7	0.6%
Derelik	55	5.0%
Devoid	30	2.8%
Domain	138	12.7%
Essence	40	3.7%
Everyshore	45	4.1%
Genesis	34	3.1%
Heimatar	55	5.0%
Kador	61	5.6%
Khanid	41	3.8%
Kor-Azor	30	2.8%
Lonetrek	69	6.3%
Metropolis	101	9.3%
Molden Heath	9	0.8%
Placid	14	1.3%
Sinq Laison	73	6.7%
Solitude	20	1.8%
Tash-Murkon	87	8.0%
The Bleak Lands	13	1.2%
The Citadel	62	5.7%
The Forge	68	6.2%
Verge Vendor	33	3.0%
	1,090	100.0%

A239 | C140 | C391 | J244 | N290 | N944 | R051 | U210 | V898

Low Sec	Systems	Expected
Aridia	75	9.2%
Black Rise	42	5.1%
Derelik	63	7.7%
Devoid	22	2.7%
Domain	54	6.6%
Essence	27	3.3%
Everyshore	9	1.1%
Genesis	69	8.4%
Heimatar	28	3.4%
Kador	24	2.9%
Khanid	43	5.3%
Kor-Azor	31	3.8%
Lonetrek	29	3.5%
Metropolis	58	7.1%
Molden Heath	29	3.5%
Placid	57	7.0%
Sinq Laison	36	4.4%
Solitude	23	2.8%
Tash-Murkon	16	2.0%
The Bleak Lands	22	2.7%
The Citadel	24	2.9%
The Forge	25	3.1%
Verge Vendor	11	1.3%
	817	100.0%

C248 | E545 | E587 | K329 | K346 | Q003 | S199 | V283 | Z060 | Z142

Null Sec	Systems	Expected	Null Sec	Systems	Expected
Branch	94	2.9%	Omist	43	1.3%
Cache	44	1.3%	Outer Passage	88	2.7%
Catch	108	3.3%	Outer Ring	59	1.8%
Cloud Ring	40	1.2%	Paragon Soul	39	1.2%
Cobalt Edge	69	2.1%	Period Basis	40	1.2%
Curse	50	1.5%	Perrigen Falls	104	3.2%
Deklein	68	2.1%	Providence	84	2.6%
Delve	97	2.9%	Pure Blind	85	2.6%
Detorid	96	2.9%	Querious	95	2.9%
Esoteria	85	2.6%	Scalding Pass	81	2.5%
Etherium Reach	100	3.0%	Stain	132	4.0%
Fade	27	0.8%	Syndicate	106	3.2%
Feythabolis	89	2.7%	Tenal	68	2.1%
Fountain	115	3.5%	Tenerifis	81	2.5%
Geminate	84	2.6%	The Kalevala Expanse	69	2.1%
Great Wildlands	101	3.1%	The Spire	72	2.2%
Immensea	84	2.6%	Tribute	54	1.6%
Impass	51	1.5%	Vale of the Silent	118	3.6%
Insmother	110	3.3%	Venal	95	2.9%
Malpais	102	3.1%	Wicked Creek	82	2.5%
Oasa	85	2.6%		3,294	100.0%

W-SPACE EXPECTED DISTRIBUTION BY CLASS/REGION

E004 | H121 | P060 | Q317 | V301 | Y790 | Z647 | Z971

Class	Region	Systems	Expected
Class 1	Region 1	133	37.2%
	Region 2	153	42.7%
	Region 3	62	17.3%
	A-R00001	10	2.8%
		358	100.0%

C125 | D364 | D382 | G024 | I182 | L005 | N766 | R943

Class	Region	Systems	Expected
Class 2	Region 4	104	19.4%
	Region 5	102	19.0%
	Region 6	141	26.3%
	Region 7	50	9.3%
	Region 8	128	23.8%
	B-R00004	12	2.2%
		537	100.0%

C247 | L477 | M267 | N968 | O477 | O883 | X702 | Z006

Class	Region	Systems	Expected
Class 3	Region 9	56	11.1%
	Region 10	51	10.1%
	Region 11	86	17.0%
	Region 12	105	20.8%
	Region 13	43	8.5%
	Region 14	96	19.0%
	Region 15	58	11.5%
	C-R00009	11	2.2%
		506	100.0%

E175 | M001 | M609 | O128 | T405 | X877 | Y683 | Z457

Class	Region	Systems	Expected
Class 4	Region 16	60	11.5%
	Region 17	25	4.8%
	Region 18	46	8.8%
	Region 19	94	18.0%
	Region 20	50	9.6%
	Region 21	115	22.0%
	Region 22	87	16.6%
	Region 23	28	5.4%
	D-R00016	18	3.4%
		523	100.0%

C008 | H296 | H900 | L614 | M555 | N062 | N432 | N770 | V911

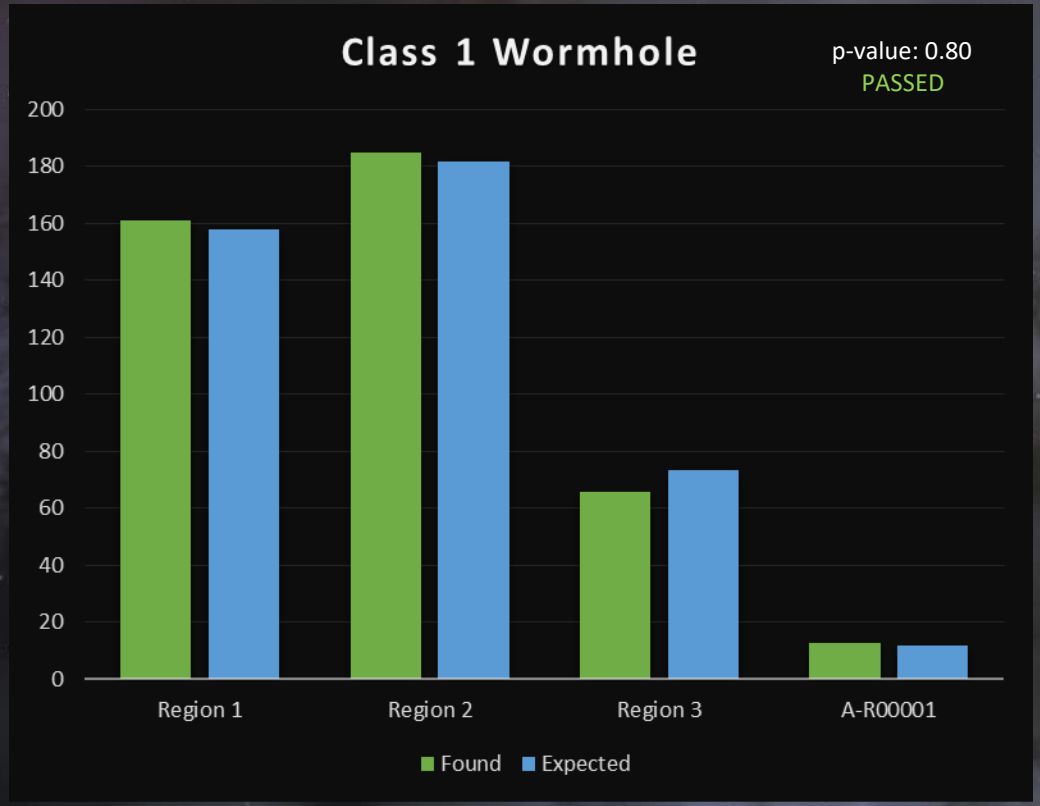
Class	Region	Systems	Expected
Class 5	Region 24	91	17.1%
	Region 25	100	18.8%
	Region 26	68	12.8%
	Region 27	71	13.4%
	Region 28	92	17.3%
	Region 29	90	16.9%
	E-R00024	19	3.6%
		531	100.0%

A982 | B041 | G008 | R474 | S804 | U319 | U574 | V753 | W237

Class	Region	Systems	Expected
Class 6	Region 30	113	95.8%
	F-R00030	5	4.2%
		118	100.0%

PHASE II CLASS 1 CHI-SQUARE GOODNESS OF FIT TEST

Region	Found	Expected	Chi-Sq	p-value
Region 1	161	157.8911	0.061216	0.80
Region 2	185	181.6341	0.062375	
Region 3	66	73.60335	0.785439	
A-R00001	13	11.87151	0.107273	
	425	425	1.016304	

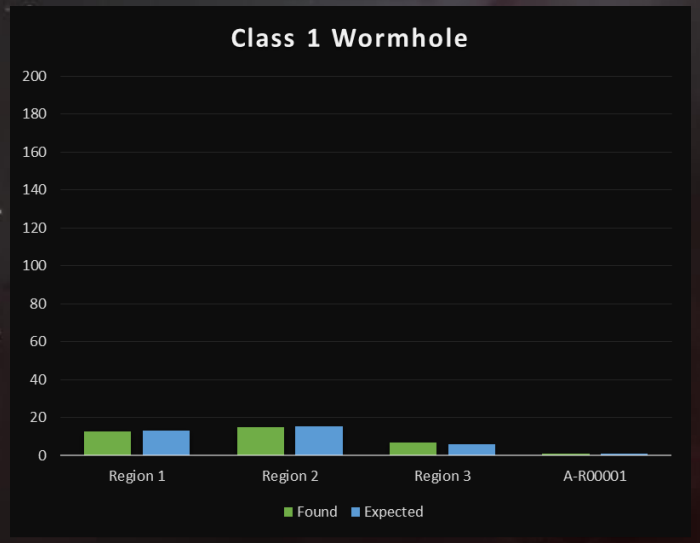


Class	Region	Systems	Expected
Class 1	Region 1	133	37.2%
	Region 2	153	42.7%
	Region 3	62	17.3%
	A-R00001	10	2.8%
		358	100.0%

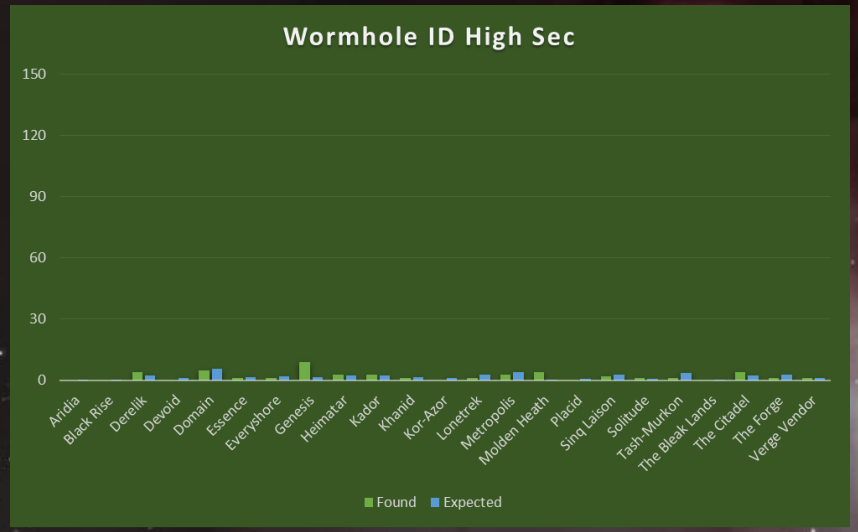
Since the p-value of 0.80 is greater than the significance level of 0.05, we accept the null hypothesis.
The observed distribution is from the same population as the expected distribution.
TLDR: Class 1 wormhole connections are equally random.

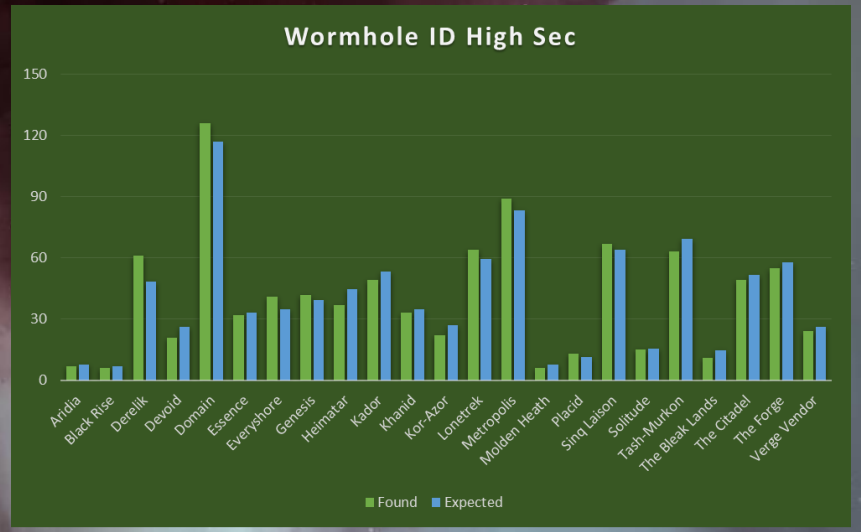
COMPARING OBSERVATIONS

PHASE I



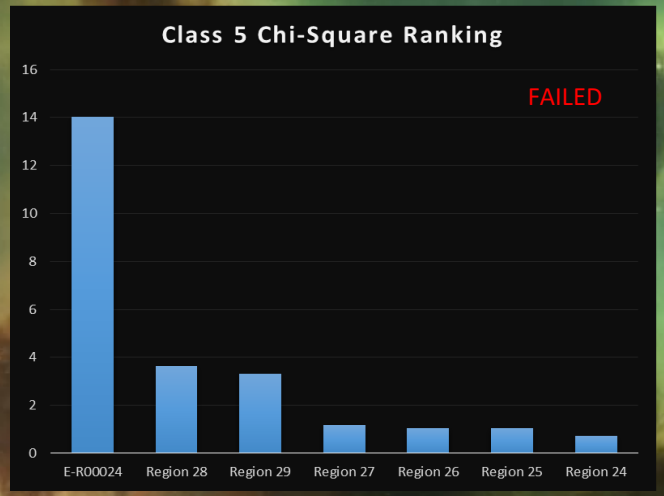
PHASE II

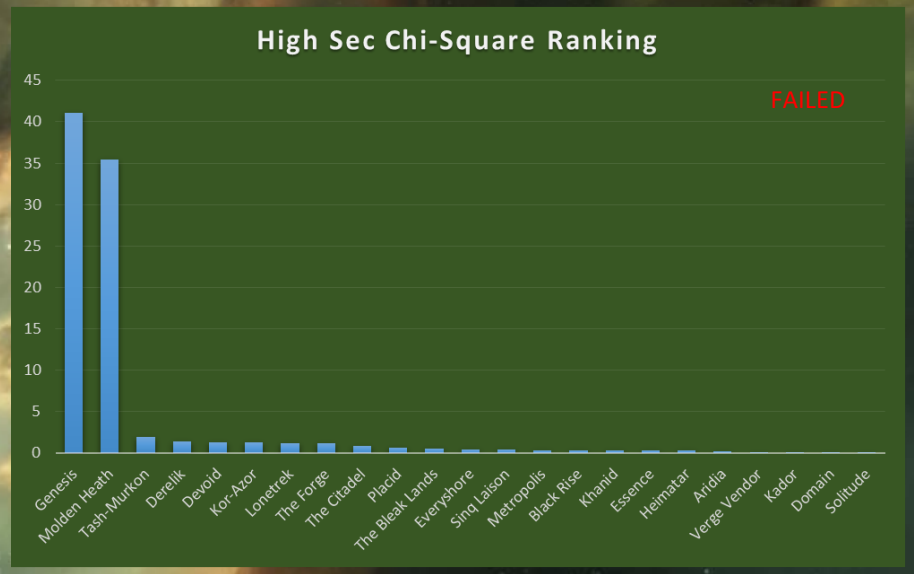




COMPARING EXCEPTIONS

PHASE I





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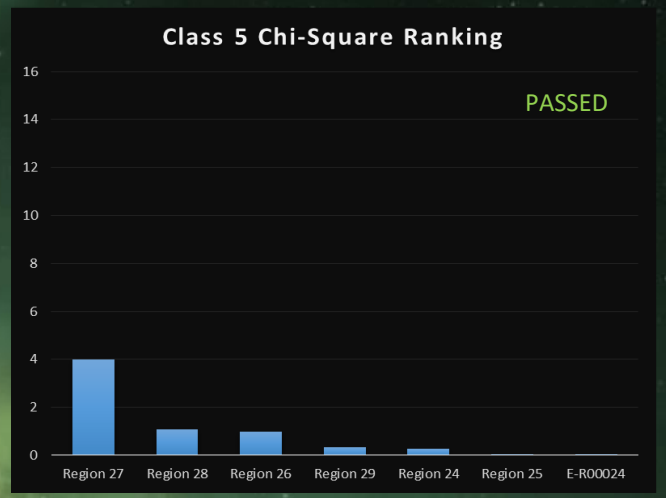
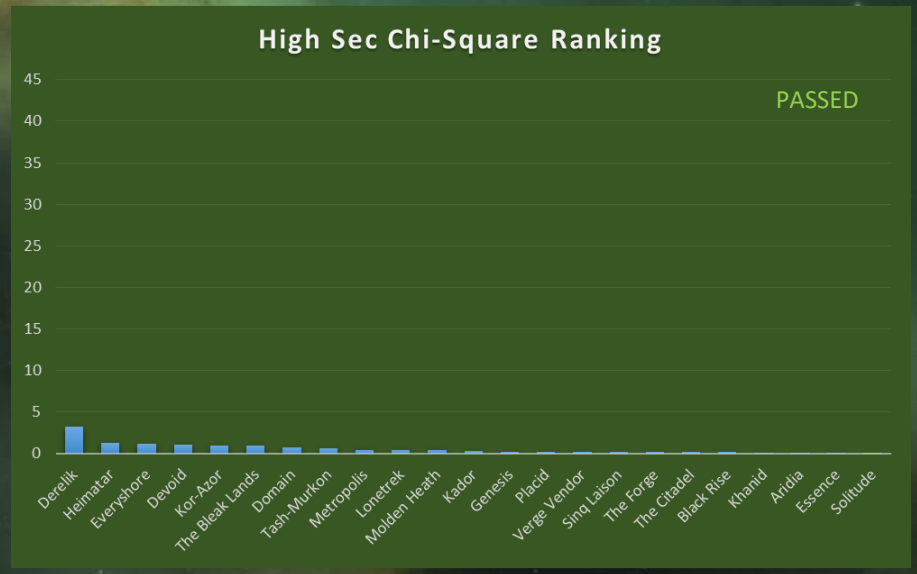
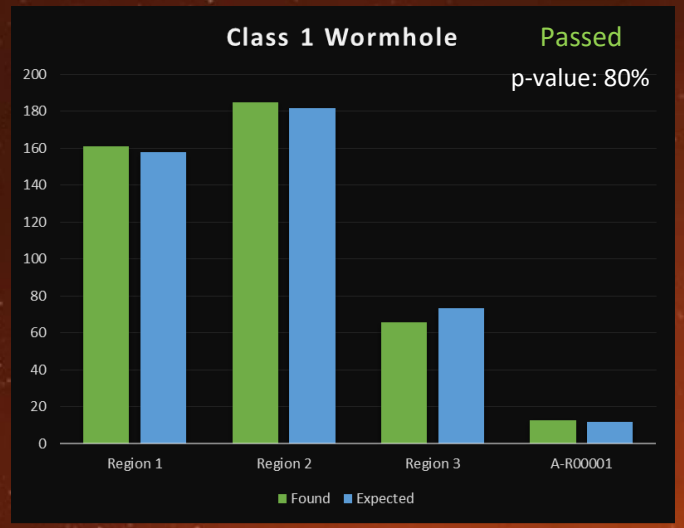
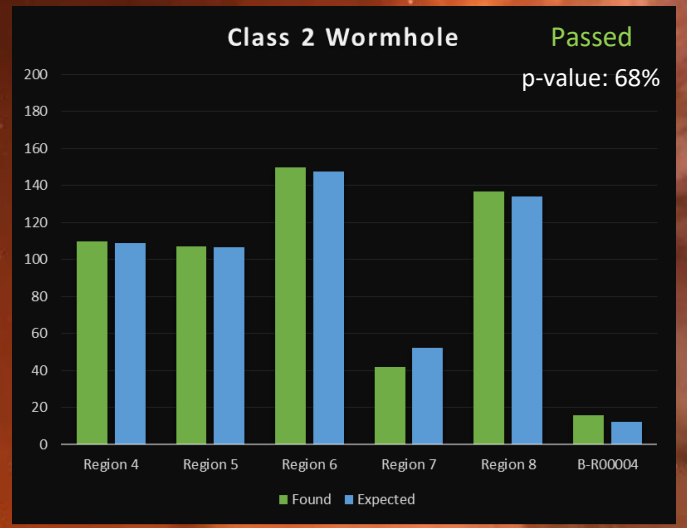
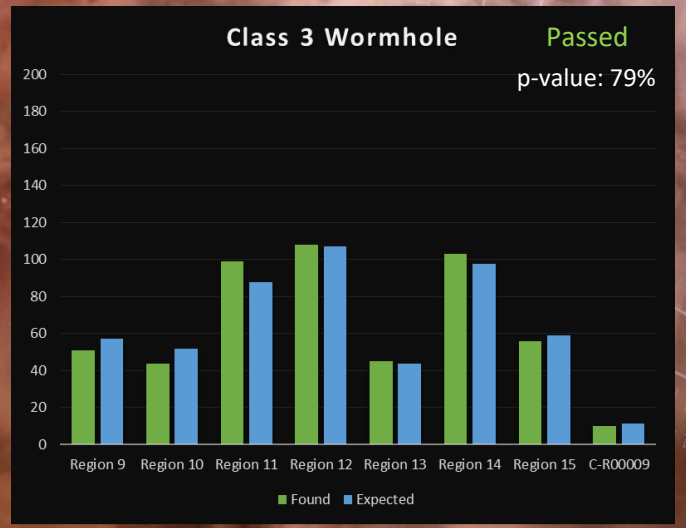


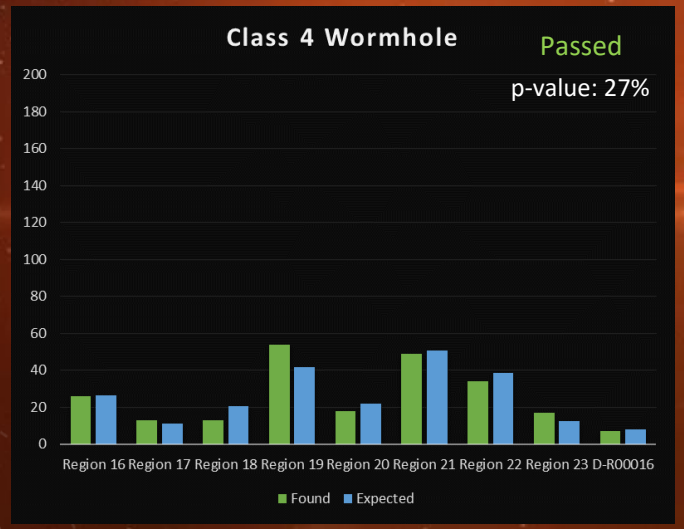


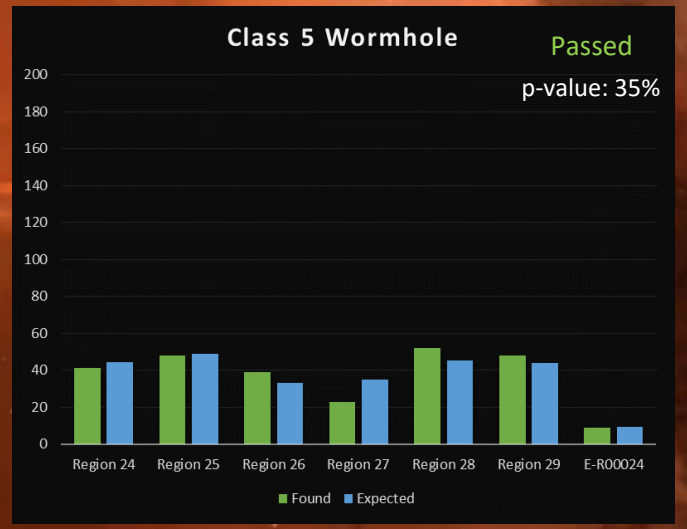
PHASE II WORMHOLE SPACE RESULTS

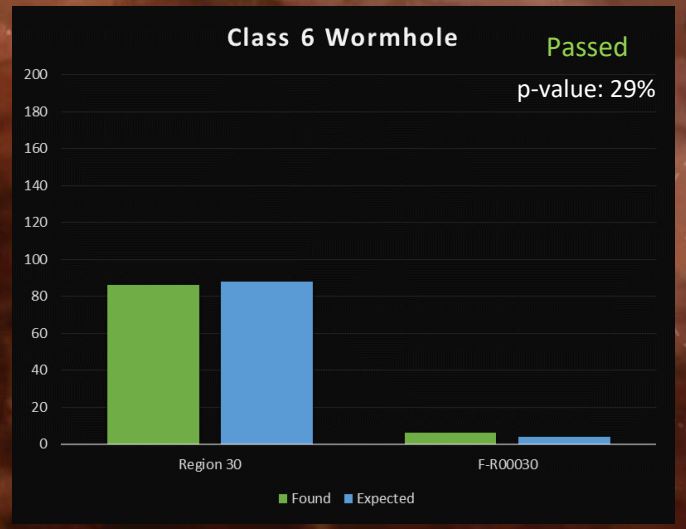




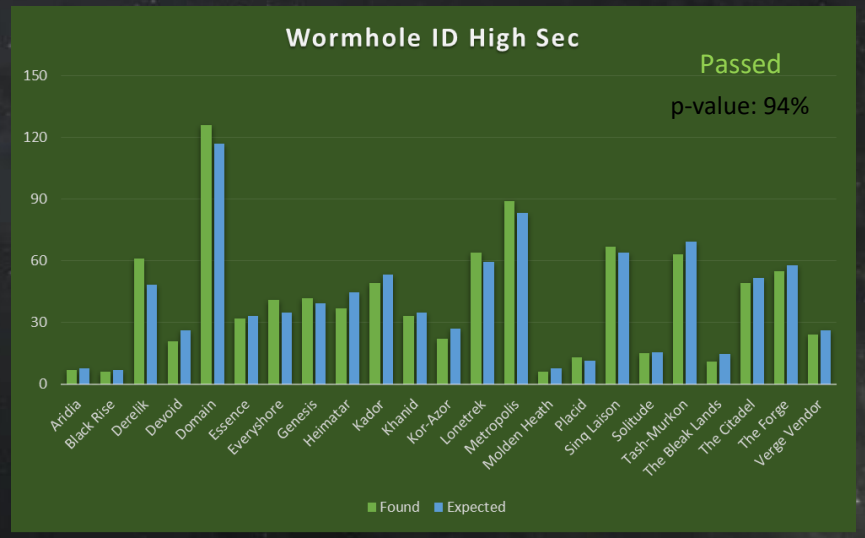


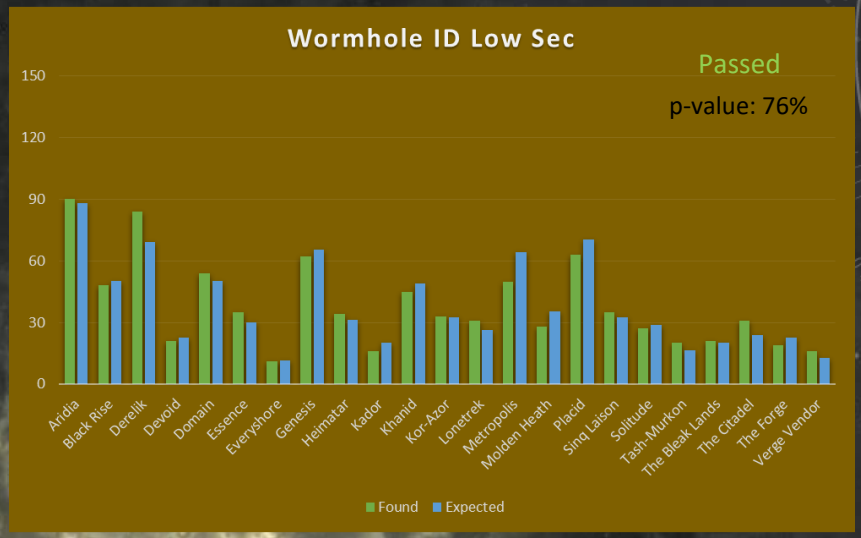


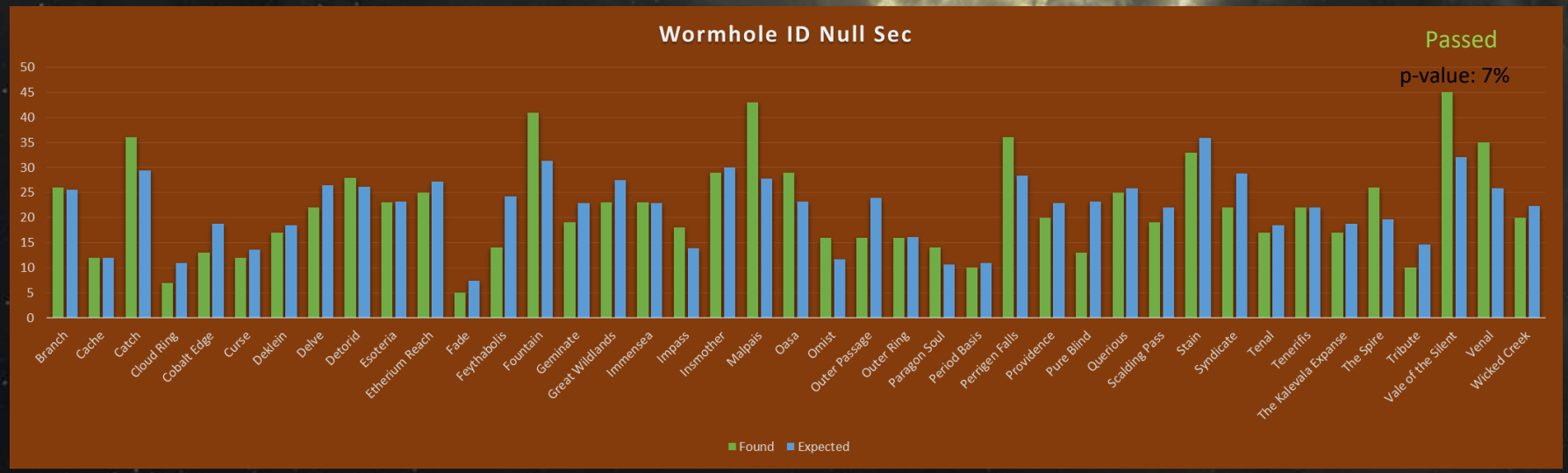




PHASE II KNOWN SPACE RESULTS







PHASE II CONCLUSIONS

- Since the p-values are greater than the significance level of 0.05, we accept the null hypothesis. The observed distribution is from the same population as the expected distribution.
- TLDR: Wormhole connections are equally random.

LINKS

- Phase I Results Presentation
- W-Space – Why you not random?
- Wormhole Type Database
- Database of New Eden Systems
- Project “W” Phase I Data
- Signal Cartel