Online Supplement

Biomarkers of Seizure Activity in Patients with Intracranial Metastasis and Gliomas: A Wide Range Study of Correlated Regions of Interest

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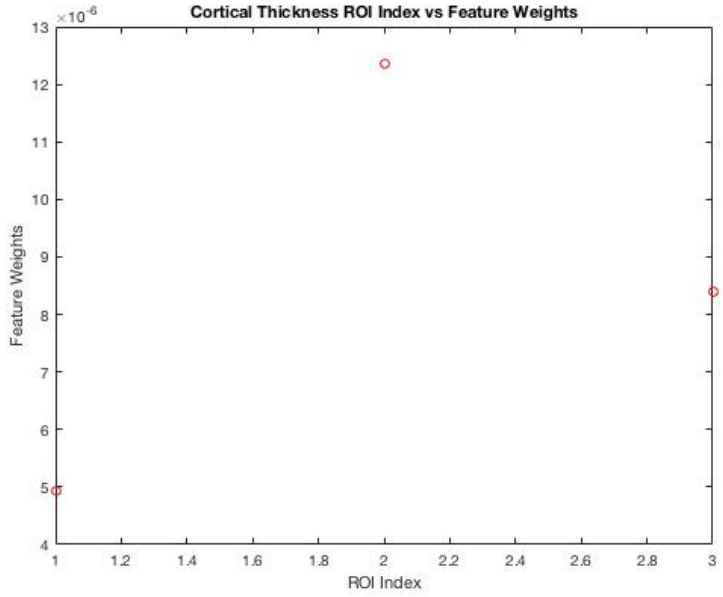
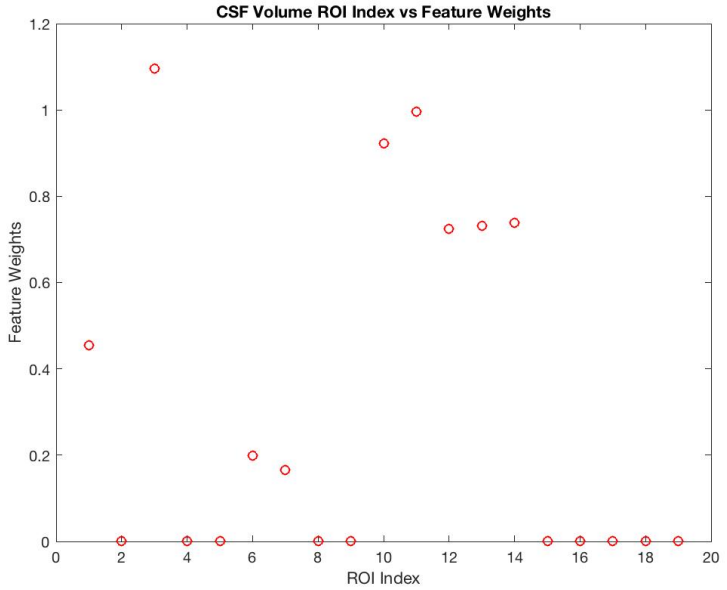
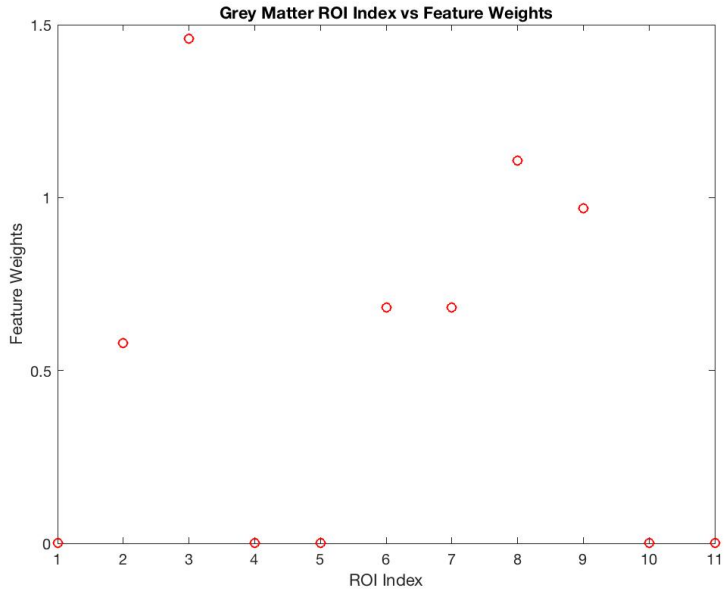
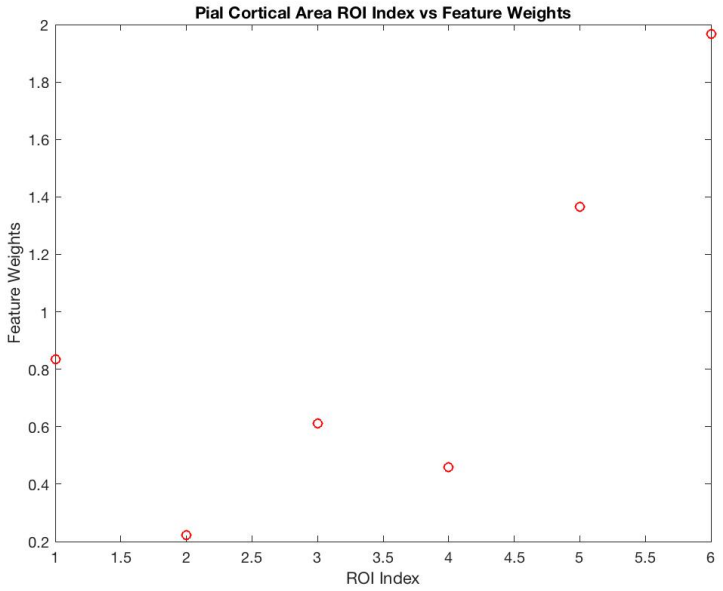
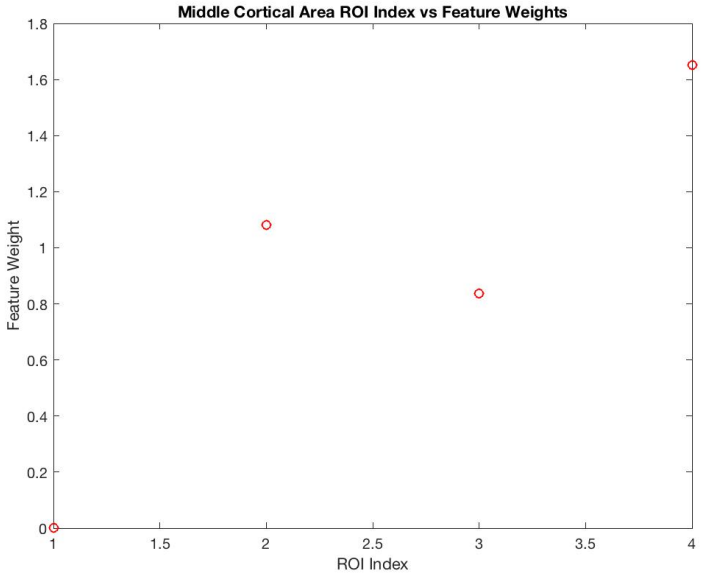
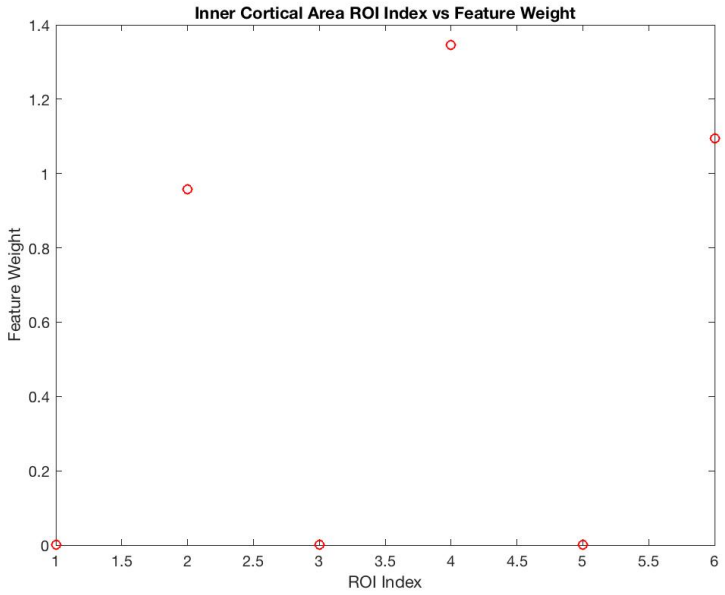









Middle Cortical Area ROI Index vs Feature Weights
Feature Weight
ROI Index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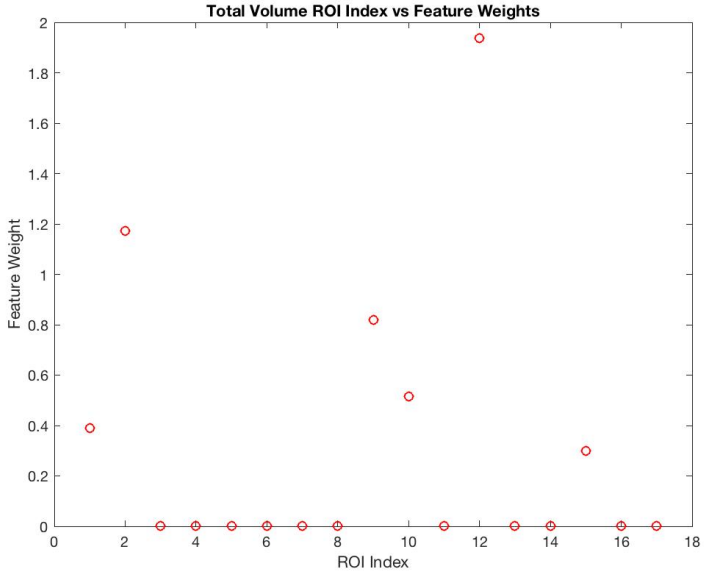
ROI Index


Total Volume ROI Index vs Feature Weights
Feature Weight
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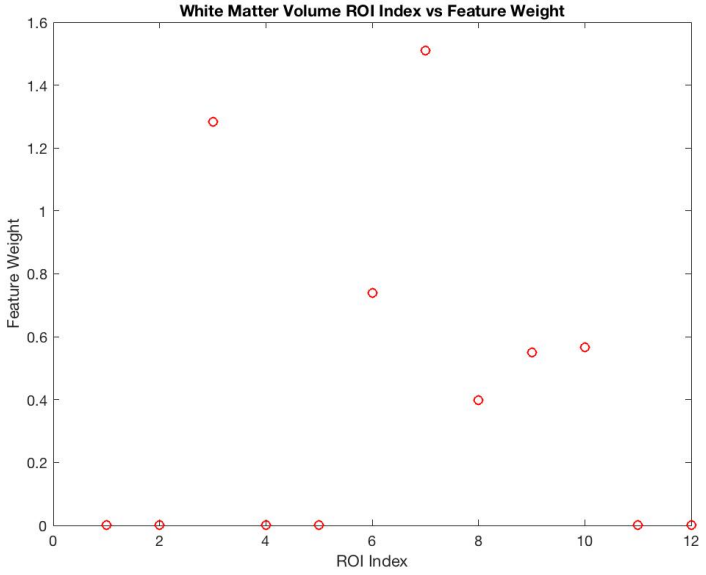
White Matter Volume ROI Index vs Feature Weight
Feature Weight
ROI Index

Table S1: Significant differences in the mean z-scores in tumor patients with seizure versus non-seizure across all volumetric COIs using one-tailed significance

Significant ROI's	Grey Matter			White Matter			Total Volume			CSF Volume		
	Seizure	**Non-Seizure**	***P* value † (1-tailed)**	**Seizure**	**Non-Seizure**	***P* value † (1- tailed)**	**Seizure**	**Non-Seizure**	***P* value † (1- tailed)**	**Seizure**	**Non-Seizure**	***P* value † (1- tailed)**
R. middle frontal gyrus	2.21	0.20	**0.045**	3.00	0.07	**0.009**	2.90	-0.12	**0.005**	-	-	-
L. middle frontal gyrus	-	-	-	-	-	-	1.63	-0.59	**0.037**	-	-	-
L. pars opercularis	-	-	-	-	-	-	-	-	-	1.79	-0.42	**0.011**
R. pars triangularis	-	-	-	0.95	-0.28	**0.042**	2.98	1.00	**0.049**	-	-	-
L. pars triangularis	3.16	1.08	**0.040**	-	-	-	-	-	-	1.38	-0.54	**0.001**
R. pars orbitalis	**1.75**	**0.31**	**0.047**	-	-	-	**2.58**	**0.59**	**0.027**	**0.36**	**-0.69**	**0.004**
L. pars orbitalis	-	-	-	0.77	-0.64	**0.021**	-	-	-	0.29	-0.78	0.002
R. precentral gyrus	1.17	0.14	**0.043**	-	-	-	-	-	-	-	-	-
L. transvers frontal gyrus	-1.50	-0.02	**0.005**	-	-	-	-1.25	0.16	**0.009**	-	-	-
L. anterior orbito-frontal gyrus	-1.50	-0.62	**0.027**	-	-	-	-1.78	-0.54	**0.041**	-	-	-
R. posterior orbito-frontal gyrus	-	-	-	-	-	-	-	-	-	-0.05	-1.09	**0.024**
L. cingulate gyrus	-	-	-	-	-	-	-	-	-	-1.07	-2.06	**0.030**
L. paracentral lobule	-	-	-	-2.70	0.94	**0.020**	-	-	-	-	-	-
L. post-central gyrus	-	-	-	-	-	-	4.48	0.81	**0.008**	-	-	-
L. supramarginal gyrus	2.96	-0.36	**<0.001**	-	-	-	4.04	-0.33	**0.001**	-0.03	1.43	**0.037**
R. angular gyrus	-	-	-	-	-	-	-	-	-	0.59	-0.56	**0.047**

L. superior parietal gyrus	-	-	-	-1.58	-0.18	**0.032**	-	-	-	-	-	-
L. temporal pole	-2.87	-1.81	**0.043**	-	-	-	-2.67	-1.54	**0.043**	-	-	-
L. superior temporal gyrus	-	-	-	0.81	-1.23	**0.007**	2.47	-0.23	**0.006**	2.00	-0.58	**<0.001**
L. transverse temporal gyrus	-0.51	0.89	**0.032**	-	-	-	-1.08	0.77	**0.009**	-	-	-
R. middle temporal gyrus	-	-	-	**3.25**	**-0.17**	**0.004**	2.66	0.38	**0.037**	2.01	-0.17	**0.004**
L. middle temporal gyrus	-	-	-	1.92	-0.74	**0.004**	0.81	-0.23	**0.038**	1.53	-0.39	**0.012**
R. inferior temporal gyrus	-	-	-	0.63	-0.54	**0.047**	-	-	-	-	-	-
L. parahippo-campal gyrus	-	-	-	-	-	-	-0.99	-0.44	**0.041**	-1.17	-1.65	**0.044**
R. hippocampus	-	-	-	1.36	2.27	**0.027**	-	-	-	-	-	-
R. superior occipital gyrus	-	-	-	-	-	-	-	-	-	-0.01	-0.85	**0.039**
L. inferior occipital gyrus	-	-	-	1.56	-0.14	**0.047**	2.34	-1.04	**0.033**	-	-	-
R. cuneus	-	-	-	-	-	-	-	-	-	-0.74	-1.38	**0.041**
R. Insula	-	-	-	-	-	-	3.70	0.80	**0.049**	-	-	-
L. Insula	-	-	-	-	-	-	4.43	0.50	**0.023**	3.51	0.58	**0.007**
R. globus pallidus	-0.51	0.23	**0.029**	-	-	-	-	-	-	-	-	-
R. medial geniculate nucleus	-	-	-	-	-	-	-	-	-	-1.47	-0.94	**0.031**
R. inferior colliculus	-	-	-	-	-	-	-	-	-	-1.48	-0.84	**0.035**
L. inferior colliculus	-	-	-	0.69	0.02	**0.040**	-	-	-	-1.73	-0.87	**0.005**
L. mamillary body	-	-	-	-	-	-	-	-	-	-0.26	-0.65	**0.049**
L. Ventricular System	1.12	0.30	**0.008**	-	-	-	-	-	-	0.03	1.06	**0.026**

†Yellow highlighted values represent the ROI in respective COI to have the highest weight in the NCA

Table S2: Mean differences in z-scores across Cortical Thickness and Cortical Area zones (mid, inner and pial) across tumor patients with and without seizures												
Significant ROI's	**Cortical Thickness**			**Mid Cortical Area**			**Inner Cortical Area**			**Pial Cortical Area**		
	Seizure	**Non-Seizure**	***P* value † (1-tailed)**	**Seizure**	**Non-Seizure**	***P* value † (1- tailed)**	**Seizure**	**Non-Seizure**	***P* value † (1- tailed)**	**Seizure**	**Non-Seizure**	***P* value † (1- tailed)**
R. pars opercularis	-	-	-	-	-	-	-2.01	-1.25	**0.049**	-	-	-
R. gyrus rectus	-0.34	0.12	**0.027**	-	-	-	-	-	**-**	-	-	-
L. paracentral lobule				-2.44	0.30	**0.027**	-2.77	0.21	**0.011**	-1.91	0.18	**0.043**
R. postcentral gyrus	-	-	-	-3.27	-1.25	**0.029**	-2.98	-1.31	**0.024**	-3.51	-0.54	**0.032**
L. supramarginal gyrus	**0.33**	**-0.13**	**0.028**									
R. pre-cuneus				-	-	-	-	-	-	-3.51	-2.55	**0.027**
L. pre-cuneus	-	-	-	-2.96	-2.12	**0.039**	**-2.68**	**-1.97**	**0.035**	-3.04	-2.02	**0.043**
L. superior temporal gyrus	-	-	-	-	-	-	**-**	**-**	**-**			
L. transverse temporal gyrus	-0.41	0.09	**0.010**	**-1.53**	**-0.53**	**0.004**	-1.90	-1.21	**0.034**	**-1.21**	**0.06**	**0.003**
R. insula				-	-	-	-	-	**-**	-1.32	-0.36	**0.028**
L. inferior occipital gyrus	-	-	-				-2.12	-1.33	**0.046**			

†Yellow highlighted values represent the ROI in respective COI to have the highest weight in the NCA

Table S3: Feature Weights By ROI Number and Category of Interest									
ROI Number	***Total Volume***	***Grey Matter***	***White Matter***	***CSF Volume***	***Cortical Pial Area***	***Cortical Middle Area***	***Cortical Inner Area***	***Cortical Thickness***	***ROI Number***
130	*3.89E-01*	*8.71E-06*	*6.04E-06*	-	-	-	-	-	*130*
131	*1.17E+00*	-	-	-	-	-	-		*131*
142	-	-		-	-	-	*1.32E-06*	-	*142*
143	-	-	-	*4.55E-01*	-	-	-	-	*143*
144	*2.34E-06*	-	*3.61E-06*	-	-	-	-	-	*144*
145	-	*5.80E-01*	-	*3.08E-06*	-	-	-	-	*145*
146	*1.89E-06*	*1.46E+00*	-	*1.10E+00*	-	-	-	-	*146*
147	-	-	*1.28E+00*	*9.44E-06*	-	-	-	-	*147*
150	-	*2.92E-06*	-	-	-	-	-	-	*150*
163	*2.44E-07*	*2.00E-05*	-	-	-	-	-	-	*163*
164	-	-	-	-	-	-	-	*4.92E-06*	*164*
169	*8.30E-07*	*6.82E-01*	-	-	-	-	-	-	*169*
170	-	-	-	*8.89E-06*	-	-	-	-	*170*
183	-	-	*3.31E-06*		*8.35E-01*	*4.35E-08*	*9.57E-01*	-	*183*
185	-	-	-	*1.99E-01*	-	-	-	-	*185*
222	-	-	-	-	*2.22E-01*	*1.08E+00*	*1.50E-06*	-	*222*
223	*1.16E-06*	-	-	-	-	-	-	-	*223*

225	*6.84E-07*	*6.82E-01*	*-*	*1.65E-01*	*-*	*-*	*-*	*1.23E-05*	*225*
226	*-*	*-*	*-*	*1.48E-05*	*-*	*-*	*-*	*-*	*226*
229	*-*	*-*	*3.67E-06*	*-*	*-*	*-*	*-*	*-*	*229*
242	*-*	*-*	*-*	*-*	*6.10E-01*	*-*	*-*	*-*	*242*
243	*-*	*-*	*-*	*-*	*4.59E-01*	*8.38E-01*	*1.35E+00*	*-*	*243*
311	*8.20E-01*	*1.11E+00*	*-*	*-*	*-*	*-*	*-*	*-*	*311*
323	*5.16E-01*	*-*	*7.40E-01*	*1.89E-06*	*-*	*-*	*-*	*8.40E-06*	*323*
325	*5.56E-06*	*9.70E-01*	*-*	*-*	*1.37E+00*	*1.65E+00*	*8.04E-07*	*-*	*325*
326	*1.94E+00*	*-*	*1.51E+00*	*9.23E-01*	*-*	*-*	*-*	*-*	*326*
327	*2.36E-06*	*-*	*3.99E-01*	*9.96E-01*	*-*	*-*	*-*	*-*	*327*
328	*-*	*-*	*5.51E-01*	*-*	*-*	*-*	*-*	*-*	*328*
342	*1.05E-06*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*342*
343	*-*	*-*	*-*	*7.24E-01*	*-*	*-*	*-*	*-*	*343*
344	*-*	*-*	*5.67E-01*	*-*	*-*	*-*	*-*	*-*	*344*
422	*-*		*-*	*7.31E-01*	*-*	*-*	*-*	*-*	*422*
443	*3.00E-01*	*-*	*1.99E-06*	*-*	*-*	*-*	*1.09E+00*	*-*	*443*
446	*-*	*-*	*-*	*7.38E-01*	*-*	*-*	*-*	*-*	*446*
500	*1.31E-06*	*-*	*-*	*-*	*1.97E+00*	*-*	*-*	*-*	*500*
501	*5.30E-07*	*-*	*-*	*6.98E-06*	*-*	*-*	*-*	*-*	*501*
616	*-*	*4.96E-07*	*-*	*-*	*-*	*-*	*-*	*-*	*616*
662	*-*	*-*	*-*	*2.51E-05*	*-*	*-*	*-*	*-*	*662*

680	-	-	-	*1.38E-05*	-	-	-	-	*680*
681	-	-	*2.78E-06*	*5.29E-06*	-	-	-	-	*681*
691	-	-	-	*7.98E-06*	-	-	-	-	*691*
701	-	*6.77E-07*	-	-	-	-	-	-	*701T*

Values not included for a category of interest for any given ROI indicates that the ROI for that category of interest was not found to be significant and therefore was not included in NCA . See index table in main manuscript for ROI description

Table S4: Corresponding Indices for Feature Weight Graphs (Figure S1) for every COI								
	Indices							
ROI	Total Volume	Grey Matter	White Matter	CSF Volume	Cortical Pial Area	Cortical Middle Area	Cortical Inner Area	Cortical Thickness
130	1	1	1	-	-	-	-	-
131	2	-	-	-	-	-	-	-
142	-	-	-	-	-	-	1	-
143	-	-	-	1	-	-	-	-
144	3	-	2	-	-	-	-	-
145	-	2	-	2	-	-	-	-
146	4	3	-	3	-	-	-	-
147	-	-	3	4	-	-	-	-
150	-	4	-	-	-	-	-	-
163	5	5	-	-	-	-	-	-
164	-	-	-	-	-	-	-	1
169	6	6	-	-	-	-	-	-
170	-	-	-	5	-	-	-	-
183	-	-	4	-	1	1	2	-
185	-	-	-	6	-	-	-	-
222	-	-	-	-	2	2	3	-
223	7	-	-	-	-	-	-	-
225	8	7	-	7	-	-	-	2
226	-	-	-	8	-	-	-	-
229	-	-	5	-	-	-	-	-
242	-	-	-	-	3	-	-	-
243	-	-	-	-	4	3	4	-

311	9	8	-	-	-	-	-	-
323	10	-	6	9	-	-	-	3
325	11	9	-	-	5	4	5	-
326	12	-	7	10	-	-	-	-
327	13	-	8	11	-	-	-	-
328	-	-	9	-	-	-	-	-
342	14	-	-	-	-	-	-	-
343	-	-	-	12	-	-	-	-
344	-	-	10	-	-	-	-	-
422	-	-	-	13	-	-	-	-
443	15	-	11	-	-	-	6	-
446	-	-	-	14	-	-	-	-
500	16	-	-	-	6	-	-	-
501	17	-	-	15	-	-	-	-
616	-	10	-	-	-	-	-	-
662	-	-	-	16	-	-	-	-
680	-	-	-	17	-	-	-	-
681	-	-	12	18	-	-	-	-
691	-	-	-	19	-	-	-	-
701	-	11	-	-	-	-	-	-