Observation Filters - Optimal, Noisy

							$\delta_{\rm H}$	c F0			δ_{HCU} F0							δ_{HC} F1						δ_{HCUFI}							δ_{HC} F2							δ_{HCUF2}					
#	$ \mathcal{G} $	% Obs	0	$ G^* $	Time	AR	FPR	FNR	Acc	S	Time	AR	FPR	FNR	Acc	S	Time	AR	FPR	FNR	Acc	S	Time	AR	FPR	FNR	Acc	S	Time	AR	FPR	FNR	Acc	S	Time	AR	FPR	FNR	Acc	S			
		10	1.25	8.0	19.742	0.43	0.27	0.3	86.1	8.08	20.124	0.43	0.27	0.3	86.1	8.11	5.498	0.4	0.55	0.04	100.0	17.67	4.445	0.4	0.55	0.04	100.0	17.67	4.436	0.39	0.61	0.0	100.0	20.33	3.696	0.39	0.61	0.0	100.0	20.33			
93		30	3.08	3.97	20.393	0.42	0.24	0.35	75.0	3.64	17.415	0.41	0.37	0.22	88.9	7.67	5.293	0.39	0.39	0.21	83.3	5.72	4.487	0.4	0.43	0.17	91.7	7.22	4.371	0.25	0.63	0.12	91.7	12.17	3.714	0.25	0.63	0.12	91.7	12.17			
BLOCKS (936)	20.3	50	4.42	2.5	20.519	0.48	0.29	0.23	72.2	3.14	17.166	0.35	0.53	0.11	91.7	8.69	4.506	0.5	0.35	0.15	80.6	3.67	4.467	0.46	0.43	0.1	91.7	6.42	3.72	0.35	0.56	0.09	88.9	6.53	3.718	0.34	0.59	0.07	91.7	7.36			
BL		70	6.67	1.94	20.672	0.75	0.16	0.09	91.7	2.19	16.492	0.51	0.43	0.06	94.4	5.36	4.505	0.72	0.21	0.07	94.4	2.39	4.502	0.57	0.38	0.06	97.2	3.94	3.706	0.62	0.3	0.08	91.7	3.03	3.708	0.56	0.37	0.08	91.7	3.58			
		100	8.83	1.83	20.709	0.69	0.15	0.16	83.3	1.75	15.404	0.65	0.31	0.04	100.0	4.25	4.481	0.74	0.11	0.16	83.3	1.67	4.446	0.73	0.14	0.13	91.7	2.5	3.711	0.58	0.26	0.16	83.3	2.25	3.708	0.66	0.26	0.08	91.7	2.75			
		10	1.63	2.71	8.021	0.82	0.09	0.09	91.7	2.75	8.501	0.8	0.11	0.09	91.7	2.94	5.736	0.62	0.35	0.03	95.8	5.15	4.239	0.62	0.35	0.03	95.8	5.15	3.477	0.38	0.61	0.01	97.9	7.27	2.804	0.38	0.61	0.01	97.9	7.27			
9.0		30	4.0	1.21	8.395	0.84	0.09	0.07	91.7	1.25	8.488	0.83	0.12	0.05	93.8	1.35	4.995	0.7	0.22	0.08	91.7	1.54	4.221	0.7	0.23	0.07	93.8	1.58	3.488	0.48	0.42	0.09	89.6	3.08	2.346	0.49	0.42	0.08	91.7	3.1			
IPC-GRID (1248)	7.5	50	6.19	1.13	8.384	0.88	0.09	0.03	97.9	1.4	8.524	0.88	0.1	0.02	97.9	1.44	4.626	0.85	0.12	0.03	97.9	1.46	4.255	0.86	0.12	0.02	97.9	1.48	3.491	0.7	0.27	0.03	97.9	2.06	2.257	0.7	0.27	0.03	97.9	2.06			
2E		70	8.69	1.04	8.476	0.94	0.05	0.01	97.9	1.17	8.545	0.92	0.07	0.01	97.9	1.21	4.311	0.94	0.05	0.01	97.9	1.13	3.679	0.92	0.07	0.01	97.9	1.17	2.821	0.86	0.13	0.01	97.9	1.27	2.284	0.84	0.15	0.01	97.9	1.31			
		100	11.88	1.0	8.575	0.97	0.03	0.0	100.0	1.06	8.581	0.97	0.03	0.0	100.0	1.06	4.366	0.97	0.03	0.0	100.0	1.06	3.525	0.97	0.03	0.0	100.0	1.06	2.834	0.94	0.06	0.0	100.0	1.13	2.34	0.94	0.06	0.0	100.0	1.13			
		10	2.0	2.83	8.825	0.75	0.21	0.04	94.4	4.06	9.349	0.71	0.25	0.04	94.4	4.47	7.119	0.47	0.51	0.02	97.2	6.67	5.934	0.47	0.51	0.02	97.2	6.67	4.828	0.28	0.72	0.0	100.0	10.0	3.956	0.28	0.72	0.0	100.0	10.0			
55		30	5.75	1.19	9.166	0.8	0.2	0.01	97.2	1.78	9.363	0.67	0.33	0.0	100.0	2.67	7.165	0.75	0.24	0.01	97.2	1.89	5.596	0.71	0.29	0.0	100.0	2.42	4.774	0.58	0.41	0.01	97.2	2.64	3.976	0.57	0.43	0.0	100.0	2.86			
(936)	10.0	50	9.42	1.06	9.283	0.88	0.11	0.01	97.2	1.31	9.399	0.79	0.2	0.01	97.2	1.61	7.028	0.88	0.11	0.01	97.2	1.31	4.995	0.79	0.2	0.01	97.2	1.61	4.837	0.79	0.19	0.01	97.2	1.53	3.945	0.74	0.25	0.01	97.2	1.72			
9		70	13.25	1.03	9.347	0.96		0.0	100.0		9.369	0.89		0.0	100.0	1.39		0.96	0.04	0.0	100.0	1.11			0.1	0.0			4.719	0.94	0.06	0.0	100.0	1.17	3.939		0.12	0.0	100.0	1.42			
		100	18.17	1.0	9.344	1.0	0.0	0.0	100.0	1.0	9.422	0.96	0.04	0.0	100.0	1.08	6.288	1.0	0.0	0.0	100.0	1.0	4.872	0.96	0.04	0.0	100.0	1.08	4.005	1.0	0.0	0.0	100.0	1.0	3.942	1.0	0.0	0.0	100.0	1.0			
		10	2.0	2.53	5.54			0.08	91.7	2.81	5.902					2.81			0.48	0.01	97.2	5.0	4.967				97.2	5.0		0.42		0.0	100.0			0.42			100.0	6.0			
OF C		30	5.42	1.22	5.773	0.74	0.19	0.07	88.9	1.58	5.942	0.67	0.33	0.0	100.0	2.58	5.19	0.66	0.3	0.04	94.4	2.03	4.995				94.4	2.14	4.604	0.4	0.58	0.02	97.2	3.33	4.475			0.02	97.2	3.42			
MICONIC (936)	6.0	50	8.42	1.06		0.88		0.03	94.4	1.19	6.001	0.59			100.0		5.019			0.03		1.19	5.004					1.81		0.76		0.01	97.2	1.67		0.72				1.83			
×		70	11.92	1.0		0.88		0.03	94.4	1.14	6.001		0.37		97.2				0.09	0.01		1.17	5.029			0.0	100.0	1.5		0.88	0.1	0.01	97.2	1.19	4.018					1.33			
		100	16.33	1.0	5.936				100.0		6.029				100.0		4.992										100.0			0.88				_		0.83			100.0				
		10	1.67	2.28	5.992			0.13		2.97							5.421				100.0	5.14	5.401				100.0		4.851			0.0	100.0	6.0		0.38			100.0	6.0			
ROVERS (936)		30	3.67	1.31	6.254			0.08	80.6	1.69	6.419			0.07		1.81	5.429			0.07		2.36	5.356			0.07		2.36	4.84		0.63	0.02	94.4	4.08		0.35				4.08			
00vE	6.0	50	5.75	1.19	6.322				77.8	1.28				0.08		1.67	5.392				80.6	1.39	5.413		0.2	0.1	83.3	1.56	4.88	0.54	0.4	0.06	91.7	2.31	3.816			0.04		2.42			
~		70	8.17	1.0			0.13		86.1	1.14	6.412				97.2	1.5	5.476			0.07		1.19	5.146					1.33	4.886		0.23	0.07	86.1	1.42	3.826			0.07		1.47			
		100	10.83	1.0	6.375				100.0		6.428		0.1		100.0		5.43				100.0	1.08	-	0.9	0.1		100.0			0.92		0.0	100.0		3.818				100.0	_			
~		10	2.33	2.11	15.938			0.27	52.8	2.78	16.849			0.2	69.4	4.03	6.767			0.17	63.9	4.0					72.2		3.77	0.27		0.04	86.1	6.67	3.748					6.81			
9 PY		30	6.5	1.25	16.338				75.0	1.53	16.453						6.593					1.47	4.596					2.89	3.692			0.14	75.0	1.69	3.692					2.17			
0K0BAN (936)	8.7	50	10.33 14.67	1.22	16.48			0.09	88.9	2.72	14.305					4.97	6.464			0.03	100.0	2.08	4.036			0.03		3.78	3.646			0.06	88.9	1.39				0.03		2.83			
S(70 100	20.17	1.03	16.502 16.414			0.04	94.4	3.44			0.5		100.0		5.637					2.33	3.643			0.0	100.0			0.83			94.4	1.92	3.623				100.0				
A	\vdash	100	20.17	1.0	_						10.433											1.0					95.35		3.638			0.04							96.0				
Average					11.004	0.75	0.10	0.09	69.21	2.10	10.433	0.08	0.27	0.05	94.28	3.1/	3.339	0.72	0.25	0.05	92.39	2.87	4.088	0.07	0.29	0.04	95.55	3.38	4.1/	0.03	0.54	0.04	94.44	3.89	3.0/	0.0	0.57	0.05	90.0	4.15			

Table 1: Results for each filtering k, with optimal observations. F0 for no filter, F1 for k=1 and F2 for k=2.

Observation Filters - Suboptimal, Noisy

	_				δ_{HC} F0 δ_{HCII} F0											δ_{HC} F1																	8							
																							δ _{HCU} F Time AR FPR FNI								δ_{HC} F2						δ_{HCU} F2			
#	$ \mathcal{G} $	% Obs	O	$ G^* $	Time	AR	FPR	FNR	Acc	S	Time	AR	FPR F	NR	Acc	S	Time	AR	FPR	FNR	Acc	S	Time	AR	FPR	FNR	Acc	S	Time	AR	FPR	FNR	Acc	S	Time	AR	FPR	FNR	Acc	S
(936)		10	1.42	7.61	19.67	0.4	0.29	0.31	77.8	8.11	20.158	0.4	0.32	.28	80.6	8.83	5.52	0.4	0.51	0.09	94.4	15.61	4.482	0.4	0.51	0.09	94.4	15.61	4.45	0.37	0.63	0.0	100.0	20.33	3.696	0.37	0.63	0.0	100.0	20.33
		30	3.83	3.58	20.431	0.38	0.27	0.35	63.9	3.17	17.398	0.34	0.47	.19	91.7	9.31	5.302	0.39	0.3	0.31	69.4	3.69	4.441	0.33	0.43	0.24	75.0	7.11	4.329	0.45	0.44	0.11	86.1	7.33	3.713	0.43	0.46	0.11	86.1	7.53
	20.3	50	5.92	3.19	20.536	0.49	0.23	0.28	80.6	3.22	17.176	0.3	0.6	0.1	100.0	9.33	4.464	0.49	0.23	0.28	80.6	3.25	4.453	0.36	0.41	0.23	86.1	6.31	3.72	0.51	0.29	0.19	86.1	4.19	3.717	0.45	0.36	0.19	86.1	5.28
BIL	İ	70	8.5	2.53	20.547	0.51	0.19	0.29	69.4	2.11	16.496	0.35	0.59	.07	100.0	9.11	4.517	0.51	0.19	0.29	69.4	2.11	4.461	0.44	0.47	0.09	94.4	6.86	3.706	0.5	0.22	0.28	72.2	2.42	3.708	0.38	0.41	0.21	77.8	5.5
	İ	100	11.83	2.25	20.589	0.66	0.17	0.17	91.7	2.08	15.575	0.58	0.29	.13	100.0	3.67	4.502	0.66	0.17	0.17	91.7	2.08	4.437	0.57	0.19	0.24	91.7	2.83	3.711	0.65	0.19	0.17	91.7	2.17	3.71	0.64	0.21	0.15	100.0	3.0
		10	2.06	1.58	8.028	0.64	0.25	0.12	87.5	2.29	8.522	0.6	0.31	.09	91.7	3.02	5.755	0.53	0.37	0.1	91.7	3.27	4.296	0.53	0.37	0.1	91.7	3.27	3.493	0.31	0.68	0.01	100.0	6.29	2.808	0.31	0.68	0.01	100.0	6.29
a_	İ	30	5.56	1.4	8.328	0.81	0.12	0.07	100.0	1.4	8.469	0.73	0.23 (.05	100.0	2.04	4.922	0.83	0.1	0.07	100.0	1.35	4.263	0.78	0.15	0.07	100.0	1.52	3.515	0.78	0.14	0.08	97.9	1.5	2.321	0.76	0.16	0.08	97.9	1.54
PC-GRID (1248)	7.5	50	8.88	1.35	8.461	0.79	0.1	0.11	91.7	1.17	8.504	0.75	0.21	.03	100.0	1.73	4.642	0.78	0.11	0.11	91.7	1.19	4.309	0.77	0.2	0.03	100.0	1.69	3.428	0.76	0.12	0.12	89.6	1.19	2.289	0.78	0.17	0.05	97.9	1.44
DG (1)	İ	70	12.56	1.31	8.517	0.87	0.05	0.08	100.0	1.1	8.546	0.75	0.19 (.06	100.0	1.44	4.34	0.87	0.05	0.08	100.0	1.1	3.648	0.75	0.19	0.06	100.0	1.44	2.82	0.87	0.05	0.08	100.0	1.1	2.278	0.77	0.16	0.07	100.0	1.35
		100	17.25	1.5	8.496	0.88	0.06	0.06	100.0	1.13	8.533	0.74	0.2	.06	100.0	1.5	4.357	0.88	0.06	0.06	100.0	1.13	3.496	0.62	0.2	0.18	87.5	1.38	2.821	0.88	0.06	0.06	100.0	1.13	2.255	0.77	0.17	0.06	100.0	1.44
		10	2.67	2.0	8.757	0.79	0.2	0.01	100.0	3.33	9.322	0.75	0.24	0.01	100.0	3.72	7.189	0.52	0.47	0.01	100.0	5.42	5.947	0.51	0.48	0.01	100.0	5.5	4.755	0.28	0.72	0.0	100.0	8.14	3.968	0.28	0.72	0.0	100.0	8.14
OGISTICS (936)		30	7.5	1.14	9.146	0.83	0.17	0.0	100.0	1.56	9.402	0.67	0.33	0.0	100.0	3.11	7.093	0.76	0.24	0.0	100.0	1.75	5.526	0.63	0.37	0.0	100.0	2.94	4.84	0.68	0.32	0.0	100.0	2.39	3.946	0.58	0.42	0.0	100.0	3.25
1ST 336)	10.0	50	11.92	1.06	9.256	0.79	0.18	0.03	94.4	1.47	9.355	0.68	0.32	0.0	100.0	2.44	7.068	0.8	0.18	0.01	97.2	1.5	5.036	0.68	0.32	0.0	100.0	2.44	4.825	0.81	0.19	0.0	100.0	1.56	3.978	0.69	0.31	0.0	100.0	2.08
90,		70	16.67	1.03	9.304	0.94	0.06	0.0	100.0	1.17	9.351	0.82	0.18	0.0	100.0	1.56	6.825	0.94	0.06	0.0	100.0	1.17	4.781	0.82	0.18	0.0	100.0	1.56	4.767	0.94	0.06	0.0	100.0	1.17	4.017	0.82	0.18	0.0	100.0	1.53
-		100	23.17	1.0	9.322	1.0	0.0	0.0	100.0	1.0	9.429	0.9	0.1	0.0	100.0	1.25	6.223	1.0	0.0	0.0	100.0	1.0	4.83	0.9	0.1	0.0	100.0	1.25	4.152	1.0	0.0	0.0	100.0	1.0	4.012	0.9	0.1	0.0	100.0	1.25
		10	3.0	1.83	5.521	0.69	0.28	0.03	91.7	2.83	5.952	0.65	0.33 (.02	94.4	3.28	5.455	0.5	0.48	0.02	94.4	3.97	5.019	0.5	0.48	0.02	94.4	3.97	4.995	0.34	0.66	0.0	100.0	5.44	4.486	0.34	0.66	0.0	100.0	5.44
2	i	30	7.67	1.25	5.752	0.69	0.22	0.09	88.9	1.58	5.954	0.43	0.55	.01	100.0	3.78	5.171	0.64	0.27	0.09	86.1	1.69	5.051	0.58	0.4	0.03	94.4	2.78	4.608	0.66	0.25	0.09	83.3	1.67	4.512	0.63	0.31	0.06	88.9	2.0
MICONIC (936)	6.0	50	12.25	1.03	5.872	0.79	0.13	0.07	86.1	1.17	6.011	0.5	0.5	0.0	100.0	3.14	4.974	0.81	0.13	0.06	88.9	1.19	5.001	0.57	0.4	0.03	97.2	2.5	4.534	0.81	0.14	0.05	91.7	1.25	4.239	0.64	0.32	0.04	94.4	2.06
MIC (6	i	70	17.33	1.0	5.941	0.81	0.13	0.06	88.9	1.19	5.998	0.37	0.63	0.0	100.0	3.5	5.028	0.82	0.12	0.06	88.9	1.17	4.968	0.51	0.49	0.0	100.0	2.81	4.51	0.85	0.11	0.04	91.7	1.17	4.018	0.59	0.41	0.0	100.0	2.33
	i	100	24.0	1.0	5.941	0.92	0.04	0.04	91.7	1.0	5.986	0.57	0.43	0.0	100.0	2.83	5.065	0.92	0.04	0.04	91.7	1.0	5.026	0.66	0.34	0.0	100.0	2.17	4.521	0.92	0.04	0.04	91.7	1.0	4.013	0.76	0.24	0.0	100.0	1.58
		10	1.83	2.39	6.019	0.73	0.18	0.09	80.6	3.0	6.358	0.74	0.18	.08	83.3	3.03	5.385	0.52	0.45	0.03	94.4	4.64	5.354	0.52	0.45	0.03	94.4	4.64	4.892	0.4	0.6	0.0	100.0	6.0	4.358	0.4	0.6	0.0	100.0	6.0
s,	i	30	4.5	1.39	6.286	0.82	0.09	0.08	83.3	1.39	6.448	0.66	0.27	.07	86.1	2.28	5.349	0.66	0.28	0.06	86.1	2.08	5.394	0.62	0.32	0.06	86.1	2.33	4.836	0.49	0.51	0.0	100.0	3.61	4.263	0.49	0.51	0.0	100.0	3.61
(936)	6.0	50	7.17	1.11	6.337	0.72	0.18	0.11	77.8	1.28	6.456	0.61	0.33 (.06	86.1	2.06	5.432	0.7	0.18	0.12	75.0	1.28	5.368	0.62	0.3	0.08	83.3	1.83	4.86	0.71	0.23	0.06	86.1	1.56	3.784	0.67	0.27	0.06	86.1	1.72
RO (S	i	70	10.0	1.06	6.406	0.81	0.13	0.06	86.1	1.22	6.432	0.64	0.35	.01	97.2	2.33	5.407	0.79	0.15	0.06	86.1	1.31	5.136	0.69	0.3	0.01	97.2	2.11	4.883	0.78	0.16	0.06	86.1	1.31	3.806	0.73	0.24	0.03	94.4	1.81
	i	100	13.67	1.0	6.417	0.88	0.08	0.04	91.7	1.08	6.512	0.83	0.17	0.0	100.0	1.58	5.395	0.88	0.08	0.04	91.7	1.08	4.942	0.83	0.17		100.0		4.821	0.88	0.08	0.04	91.7	1.08	3.764	0.83	0.17	0.0	100.0	1.58
		10	3.33	1.83	15.992	0.41	0.29	0.3	52.8	1.92	16.815	0.35	0.45	0.2	69.4	3.67	6.684	0.39	0.35	0.27	55.6	2.19	4.745	0.35	0.4	0.25	55.6	2.81	3.728	0.35	0.53	0.11	77.8	4.22	3.739	0.35	0.53	0.11	77.8	4.22
3	i	30	8.67	1.28	16 514	0.64	0.21	0.15	80.6	2.14	16.545	0.4	0.59	.02	97.2	5 19	6 585	0.66	0.16	0.18	75.0	1.36	4.643	0.45	0.51	0.04	94.4	4 03	3.718	0.66	0.19	0.16	77.8	1.5	3 749	0.46	0.49	0.05	91.7	3.72
0KOBAN (936)	8.7	50	13.75	1.33				0.19		2.08	14.368					4.69			0.19			1.67	3.891				97.2					0.13		1.53					100.0	
90K		70	19.33	1.36	16.598	0.5	0.38	0.12	88.9	4.0	13.732	0.27	0.66	.07	94.4	6.0	5.694	0.6	0.26	0.13	88.9	2.97	3.743	0.34	0.58	0.08	94.4	5.11	3.71	0.69	0.12	0.19	83.3	1.44	3.707	0.41	0.49	0.09	91.7	3.89
		100	27.0	1.33	16.672	0.47	0.45	0.08	91.7	4.67	13.637	0.33	0.63 (.04	91.7	5.67	5.706	0.72	0.2	0.08	100.0	2.75	3.82	0.52	0.48	0.0	100.0	4.33	3.703	0.79	0.13	0.08	100.0	2.17	3.21	0.61	0.36	0.03	100.0	3.17
Average													0.37								89.07		4.684																95.69	
·····					1				00				/				2.270				0,,107						,00						40		2.00		0.007			

Table 2: Results for each filtering k, with suboptimal observations. F0 for no filter, F1 for k=1 and F2 for k=2.