COM-RP-MPE-DRG-173

Processing EVP-132 Datasets

prepared by

Georg Weidenspointner and Thomas van Sant

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1 Introduction

This report is a brief summary of the processing of `EVP` datasets with quality flag 132[1], in the following denoted by `EVP-132`. These are `EVP` datasets with ToF values of the highest quality available at present ($\mathrm{ToF_{III}}$ according to the nomenclature introduced by Rob van Dijk in his PhD thesis). The corrections applied to the raw $\mathrm{ToF_0}$ values to determine the $\mathrm{ToF_{III}}$ values and the differences between the $\mathrm{ToF_{II}}$ `EVP` data routinely used in the standard scientific analysis (`EVP-131`) and $\mathrm{ToF_{III}}$ `EVP` data are described in detail in *Approaching the TOF resolution limit* (`COM-RP-ROL-DRG-62`) by Rob van Dijk and in Rob van Dijk's PhD thesis.

In these works Rob van Dijk could show that the width of the ToF forward peak is narrower for $\mathrm{ToF_{III}}$ data than for $\mathrm{ToF_{II}}$ data, but it remained unclear what the benefit for scientific analysis was and if a reprocessing of all `EVP-131` datasets was warranted. In *Studying the ToF Spectrum as a Function of Energy Part 2: the Forward Peak Region* (`COM-RP-MPE-DRG-171`) by G. Weidenspointner and M. Varendorff these initial results were confirmed in more detail. Moreover, it was demonstrated that it is better to use $\mathrm{ToF_{III}}$ data than the standard $\mathrm{ToF_{II}}$ data for the spectral CDG analysis.

Therefore `EVP-132` datasets were processed at MPE and UNH, at first for the Virgo Region only. To analyse also other regions of the sky (see *Status of Spectral CDG Analysis: Algorithm and Results, Issue 2* (`COM-RP-MPE-DRG-172`) by G. Weidenspointner and M. Varendorff) `EVP-132` datasets for a substantial fraction of all Observation Periods were generated at MPE. The desire to ultimately include the whole sky in the CDG analysis and the effectiveness of the procedure set up for the processing of `EVP-132` datasets allowed us to generate these data for practically all days since launch.

[1]Please refer to *COMPTEL Data Analysis Standards* (`COM-MO-DRG-MGM-231`) by Roland Diehl with DRG for the definitions of the different `EVP` quality flags. The `EVP` data quality flag 132 was formally introduced during the Oct. 95 team meeting at UNH.

2 Procedure

The primary goal for generating EVP-132 datasets was to have $\mathrm{ToF}_{\mathrm{III}}$ data available for the CDG analysis. At the same time, care was also taken that the event Earth horizon angle is correct, so that these data can be used for other analyses. Thus the EVP-132 datasets were generated according to the following procedure.

- Whenever an EVP-130 or EVP-131 dataset was available, this dataset was run through IFCTCF written by Rob van Dijk to generate an EVP-132 dataset. All corrections possible according to this routine were applied.
- In all other cases first an auxiliary EVP dataset was generated with the correct event Earth horizon angle by running EVPRNN or EVPSLC. A quality flag of 97 was assigned to these auxiliary EVP datasets (eventually, these EVP-97 data sets could become EVP-131 datasets). Then these EVP-97 datasets were run through IFCTCF.
- Since TJD 10399 (OP 602) an EVP-132 dataset is generated along with the standard EVP-131 dataset in the routine processing.

At present, for almost every day since launch an EVP-132 data set is available. All OPs from Phases 1-5 for which EVP-132 datasets exist, along with the corresponding list identifier and some comments, are summarized in Tables 1 through 5. Days which are missing usually are days where problems such as event timetag errors occurred, which cannot be fixed quickly. For a few days, however, it is not yet possible to generate an EVP-132 data set. For each day of Phase 6 an EVP-132 dataset exists. So far, lists have only been generated for those OPs relevant for the CDG analysis.

OP	TJDs	List Identifier	Comments
0	8370 - 8385	-	Cal. phase, TJD 8383 cannot be reprocessed
1	8392 - 8406	M-EVP-34928	
2	8406 - 8415	M-EVP-34663	
2.5	8415 - 8422	M-EVP-35845	
3	8422 - 8435	M-EVP-33198	
4	8435 - 8449	M-EVP-33201	
5	8449 - 8463	M-EVP-33258	
6	8463 - 8476	M-EVP-35846	
7	8476 - 8483	M-EVP-35847	
7.5	8483 - 8490	M-EVP-33259	
8	8490 - 8504	M-EVP-36060	
9	8504 - 8511	M-EVP-34350	
9.5	8511 - 8518	M-EVP-34351	
10	8518 - 8532	M-EVP-33202	
11	8532 - 8546	M-EVP-32916	
12	8546 - 8560	M-EVP-34455	
13	8560 - 8567	M-EVP-33063	
13.5	8567 - 8574	M-EVP-32917	
14	8574 - 8588	M-EVP-35848	
15	8588 - 8602	M-EVP-35849	
16	8602 - 8617	M-EVP-32918	
17	8617 - 8631	M-EVP-35850	
18	8631 - 8644	M-EVP-32915	
19	8644 - 8658	M-EVP-36135	TJDs 8649, 8650 cannot be reprocessed
20	8658 - 8672	M-EVP-34664	
21	8672 - 8686	M-EVP-32865	no data for TJDs 8685 and 8686
22	8686 - 8700	-	OP not processed
23	8700 - 8714	M-EVP-34756	no data for TJD 8700
24	8714 - 8721	M-EVP-33062	
24.5	8721 - 8728	M-EVP-30965	
25	8728 - 8735	M-EVP-32892	TJD 8731 cannot be reprocessed
26	8735 - 8740	M-EVP-35851	
27	8740 - 8749	M-EVP-30544	
28	8749 - 8756	M-EVP-35852	
29	8756 - 8777	M-EVP-35853	
30	8777 - 8784	M-EVP-32893	
31	8784 - 8798	M-EVP-34665	
32	8798 - 8805	M-EVP-34666	
33	8805 - 8819	M-EVP-32712	no data for TJDs 8807 - 8810
34	8819 - 8840	M-EVP-35854	
35	8840 - 8845	M-EVP-35855	
36	8845 - 8846	M-EVP-35856	
36.5	8846 - 8854	M-EVP-35857	
37	8854 - 8861	M-EVP-35858	
38	8861 - 8866	M-EVP-35859	
39	8866 - 8882	M-EVP-35860	
40	8882 - 8903	M-EVP-30545	
41	8903 - 8910	M-EVP-34667	
42	8910 - 8924	M-EVP-35861	
43	8924 - 8929	M-EVP-36061	
44	8929 - 8943	M-EVP-34668	

Table 1: “Phase 1” EVP-132 data sets.

OP	TJDs	List Identifier	Comments
201	8943 - 8950	M-EVP-32378	TJD 8950 cannot be reprocessed
202	8950 - 8957	M-EVP-32379	TJD 8950 cannot be reprocessed
203.0	8957 - 8964	M-EVP-32015	
203.3	8964 - 8971	M-EVP-32014	
203.6	8971 - 8978	M-EVP-31966	
204	8978 - 8985	M-EVP-30546	
205	8985 - 8992	M-EVP-30547	
206	8992 - 8999	M-EVP-30548	
207	8999 - 9020	M-EVP-30794	
208	9020 - 9027	M-EVP-34793	
209	9027 - 9040	M-EVP-31015	
210	9040 - 9043	M-EVP-30550	
211	9043 - 9055	M-EVP-35862	
212	9055 - 9069	M-EVP-32016	
213	9069 - 9075	M-EVP-34170	
214	9075 - 9078	M-EVP-30551	
215	9078 - 9083	M-EVP-34760	
216	9083 - 9089	M-EVP-30552	
217	9089 - 9097	M-EVP-34761	
218	9097 - 9110	M-EVP-30553	
219.4	9112 - 9113	M-EVP-30554	
220	9115 - 9120	M-EVP-35863	
221	9120 - 9131	M-EVP-34167	
222	9131 - 9138	M-EVP-30555	
223	9138 - 9141	M-EVP-30556	
224	9141 - 9152	M-EVP-36134	
225	9152 - 9157	-	REBOOST
226	9157 - 9167	M-EVP-30557	
227	9167 - 9181	M-EVP-30558	
228	9181 - 9195	M-EVP-30966	
230.0	9195 - 9198	M-EVP-35864	
230.5	9198 - 9202	M-EVP-34762	
231	9202 - 9209	M-EVP-30559	
229.0	9209 - 9210	M-EVP-30560	
229.3	9210 - 9211	M-EVP-30561	
229.5	9211 - 9216	M-EVP-32092	

Table 2: “Phase 2” EVP-132 data sets.

OP	TJDs	List Identifier	Comments
301	9216 - 9223	M-EVP-30967	
232.0	9223 - 9225	M-EVP-32088	
232.5	9225 - 9237	M-EVP-30564	
302.0	9237 - 9239	M-EVP-30565	
302.3	9239 - 9251	M-EVP-30566	
303.0	9251 - 9252	M-EVP-34764	
303.2	9252 - 9261	M-EVP-34882	
303.5	9261 - 9277	-	REBOOST
303.7	9277 - 9279	M-EVP-34795	TJD 9277 is missing
304	9279 - 9285	M-EVP-30568	
305	9285 - 9293	M-EVP-31345	
306	9293 - 9300	M-EVP-30570	
307	9300 - 9307	M-EVP-30571	
308.0	9307 - 9310	M-EVP-30572	
308.3	9310 - 9314	-	REBOOST
308.6	9314 - 9322	M-EVP-30573	TJD 9314 is missing
310	9322 - 9334	M-EVP-32026	
311.0	9334 - 9336	M-EVP-30574	
311.3	9336 - 9338	-	REBOOST
311.6	9339 - 9341	M-EVP-30575	
312	9341 - 9348	M-EVP-30576	
313	9348 - 9355	M-EVP-30577	
314	9355 - 9368	M-EVP-35866	
315	9368 - 9375	M-EVP-35867	
316	9375 - 9384	M-EVP-34765	
318	9384 - 9391	M-EVP-35868	
321.1	9391 - 9398	M-EVP-30968	
321.5	9398 - 9400	M-EVP-30969	
317	9400 - 9412	M-EVP-30970	
319	9412 - 9419	M-EVP-30971	
320	9419 - 9426	M-EVP-30972	
319.5	9426 - 9433	M-EVP-34903	
323	9433 - 9447	M-EVP-30578	
322	9447 - 9461	M-EVP-30579	
324	9461 - 9468	M-EVP-30580	
325	9468 - 9482	M-EVP-35869	
326	9482 - 9489	M-EVP-30581	
327	9489 - 9496	M-EVP-35870	
328	9496 - 9503	M-EVP-36062	
329	9503 - 9510	M-EVP-35871	
331.0	9510 - 9513	M-EVP-35872	
330	9513 - 9517	M-EVP-30582	
331.5	9517 - 9521	M-EVP-36063	
332	9521 - 9538	M-EVP-32167	TJD 9525 cannot be reprocessed
333	9538 - 9545	M-EVP-36064	
335.0	9545 - 9551	M-EVP-35873	
334	9551 - 9558	M-EVP-30583	
335.5	9558 - 9565	M-EVP-35874	
336.0	9565 - 9568	M-EVP-35875	
336.5	9568 - 9573	M-EVP-30584	
337	9573 - 9593	M-EVP-32018	
338.0	9593 - 9595	M-EVP-30585	
338.5	9595 - 9615	M-EVP-35876	
339	9615 - 9629	M-EVP-32301	TJD 9627 cannot be reprocessed

Table 3: “Phase 3” EVP-132 data sets.

OP	TJDs	List Identifier	Comments
401	9629 - 9643	M-EVP-36136	TJD 9632 cannot be reprocessed
402	9643 - 9650	M-EVP-35880	
402.5	9650 - 9657	M-EVP-36086	
403	9657 - 9665	M-EVP-32656	
403.5	9665 - 9671	M-EVP-32071	
404	9671 - 9685	M-EVP-30586	
405	9685 - 9693	M-EVP-30587	
405.5	9693 - 9699	M-EVP-30588	
406	9699 - 9706	M-EVP-30589	
407	9706 - 9720	M-EVP-30590	
408	9720 - 9727	M-EVP-30591	
409	9727 - 9741	M-EVP-35881	
410	9741 - 9762	M-EVP-36018	TJD 9754 has invalid timetag
411.1	9762 - 9769	M-EVP-34913	
411.5	9769 - 9776	M-EVP-34929	
412	9776 - 9783	M-EVP-34930	
413	9783 - 9797	M-EVP-35883	
414	9797 - 9805	M-EVP-35884	
414.3	9805 - 9811	M-EVP-30592	
419.1	9811 - 9818	M-EVP-35885	
415	9818 - 9832	M-EVP-35886	
418	9832 - 9846	M-EVP-30973	
419.5	9846 - 9860	M-EVP-32020	
420	9860 - 9874	M-EVP-32021	
421	9874 - 9881	M-EVP-30593	
422	9881 - 9888	M-EVP-30594	
423	9888 - 9898	M-EVP-30595	
423.5	9898 - 9908	M-EVP-30596	
424	9908 - 9923	M-EVP-32022	
425	9923 - 9937	M-EVP-32380	
426	9937 - 9951	M-EVP-35887	
427	9951 - 9967	M-EVP-36118	
428	9967 - 9980	M-EVP-30597	
429	9980 - 9987	M-EVP-30598	
429.5	9987 - 9993	M-EVP-35889	

Table 4: “Phase 4” EVP-132 data sets.

OP	TJDs	List Identifier	Comments
501	9993 - 10007	M-EVP-30599	
502	10007 - 10021	M-EVP-32023	
505	10021 - 10028	M-EVP-35891	
506	10028 - 10035	M-EVP-34904	
503	10035 - 10042	M-EVP-35892	
504	10042 - 10049	M-EVP-35893	
507	10049 - 10065	M-EVP-36087	
508	10065 - 10071	M-EVP-30600	
509	10071 - 10084	M-EVP-30601	
510	10084 - 10087	M-EVP-31956	
510.5	10087 - 10098	M-EVP-31955	
511	10098 - 10112	M-EVP-30602	
511.5	10112 - 10119	M-EVP-30603	
513	10119 - 10126	M-EVP-30604	
514	10126 - 10133	M-EVP-31384	
515	10133 - 10147	M-EVP-32025	TJD 10146 cannot be reprocessed
517	10147 - 10160	M-EVP-30793	TJD 10155 cannot be reprocessed
516.1	10160 - 10163	M-EVP-32024	
516.5	10163 - 10176	M-EVP-32657	
518.5	10176 - 10196	M-EVP-31016	
519	10196 - 10210	M-EVP-31954	
520	10210 - 10224	M-EVP-31953	
520.4	10224 - 10231	M-EVP-33102	TJD 10225 has invalid timetag
521	10231 - 10245	M-EVP-36088	
522	10245 - 10248	M-EVP-36089	
522.5	10248 - 10259	M-EVP-34931	
523	10259 - 10273	M-EVP-36120	
524	10273 - 10287	M-EVP-33199	
525	10287 - 10294	M-EVP-33200	
526	10294 - 10308	M-EVP-36090	
527	10308 - 10315	M-EVP-36091	
528	10315 - 10322	M-EVP-36092	
529.5	10322 - 10332	M-EVP-33558	
530	10332 - 10359	M-EVP-34932	
531	10359 - 10371	M-EVP-36119	

Table 5: "Phase 5" EVP-132 data sets.

OP	TJDs	List Identifier	Comments
601.1	10371 - 10385	M-EVP-36094	
520.9	10358 - 10399	M-EVP-36095	
602	10399 - 10406	M-EVP-33417	
603	10406 - 10413	M-EVP-33418	
605.1	10413 - 10420	M-EVP-33419	
604.1	10420 - 10427	M-EVP-33559	
606	10427 - 10434	M-EVP-34217	
607	10434 - 10440	M-EVP-34218	
608	10440 - 10447	M-EVP-34219	
609	10447 - 10455	M-EVP-34220	
610	10455 - 10462	M-EVP-34229	
610.5	10462 - 10469	M-EVP-34230	
611.1	10469 - 10476	M-EVP-34231	
614.5	10490 - 10497	M-EVP-34223	

Table 6: "Phase 6" EVP-132 data sets. Note that since TJD 10399 (OP 602) EVP-132 data sets are routinely generated.