

KM3NeT events for Wavefier

Status

14/10/2022

Format definition: Open Event Writer

- See git: <https://git.km3net.de/jschnabel/open-event-writer>
- At the moment only exploratory notebook
 - Will be transformed to python package later
 - Dependent on km3io and km3astro
 - Writing fits with astropy.fits
- Using Wiki for key questions:
<https://git.km3net.de/jschnabel/open-event-writer/-/wikis/home>

```
oel = OpenEventList()
oel.set_data(evtlist["id"], evtlist["time"],
oel.set_header()
oel.write_fits("firstlight.fits")
```

```
from gammapy.data import EventList
events = EventList.read("firstlight.fits")
```

Test file: firstlight.fits

```
1 events.table
```

Table length=10

EVENT_ID	TIME	ENERGY	RA	DEC
	s	GeV	deg	deg
int64	float64	float32	float32	float32
5971000182000000	1567036818.0270312	99.10458	165.9601	-13.6233835
5971000183000000	1567036818.038107	99.10458	174.12994	-10.832835
5971000202000001	1567036820.0221283	99.10458	169.67836	-49.68932
5971000165000000	1567036816.0516515	37.855152	172.47589	-55.887978
5971000165000001	1567036816.054718	99.10458	198.69978	-73.30553
5971000165000002	1567036816.058207	7.169168	188.59581	4.8056197
5971000222000002	1567036822.0247447	99.10458	192.11841	8.989557
5971000185000003	1567036818.0550647	99.10458	242.0818	-44.16695
5971000185000004	1567036818.059714	49.13673	173.90073	-52.145638
5971000204000000	1567036820.0454955	20.351376	219.32198	-79.6997

- Small test file with few events
- Readably with Gammapy
- Containing minimal event information
- Usable as “preview” for data format
- Under development & lacking a more detailed discussion of entries

→ please give feedback about any bugs or missing information!

The dataset for Wavefier

- Neutrino event list as `gammapy.EventList`
- Due to low signal expectation would use standard diffuse neutrino set without specific source generation (“background only”)
- Specifying observation regions and time according to source catalogue