DRAFT

Feb 6, 2023

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Inputs to μGT (φ, η, Et, *S*)

This document defines the interface between **μGT** and **Calo Trigger Layer-1**.

Table 1 shows the bits/resolution per object instance for all objects. ”Collection” or ”object types” are physical entities. ”Instances” or ”objects” are their individual representatives such as ”first jet”, ”second jet”, etc.

Tables 2, 3, and 4 show the summary of the optical link, where ADI abbreviates *Anomaly Detection Integer* Part, ADD abbreviates *Anomaly Detection Decimal* Part, HIB abbreviates *Heavy Ion Bits*, BJET1 abbreviates *Boosted Jet 1*, BJET2 abbreviates *Boosted Jet 2* etc.

Tables 5, 6, 7, and 8 present the jet object data structure and descriptions.

Table 9 covers the anomaly detection score bit usage.

Table 10 shows the heavy iso bit data structure.

Table 1: Scales

object	collections × instances	parameter	range	step	bits
jet	1*6	Et η φ quality flag	<0, 1024> GeV <-5, 5> 2π	0.5 non-linear, Table 6 2π/72~0.088	11 7+1 = 8 8 1
anomaly detection	1*1	*S*	0..255	0.00390625	16
heavy ion	1*1	TBD			8

Table 2: Summary of optical link (overview)

	bits	
word	**31-28**	**27-0**
0	ADI	BJET1
1		BJET2
2	ADD	BJET3
3		BJET4
4	HIB	BJET5
5		BJET6

Table 3: Summary of optical link (sequential)

type	**bits**	**range**
BJET1	28	27-0
ADI	4	31-28
BJET2	28	59-32
ADI	4	63-60
BJET3	28	91-64
ADD	4	95-92
BJET4	28	123-96
ADD	4	127-124
BJET5	28	155-128
HIB	4	159-156
BJET6	28	187-160

HIB	4	191-188

Figure 1: Summary of optical link

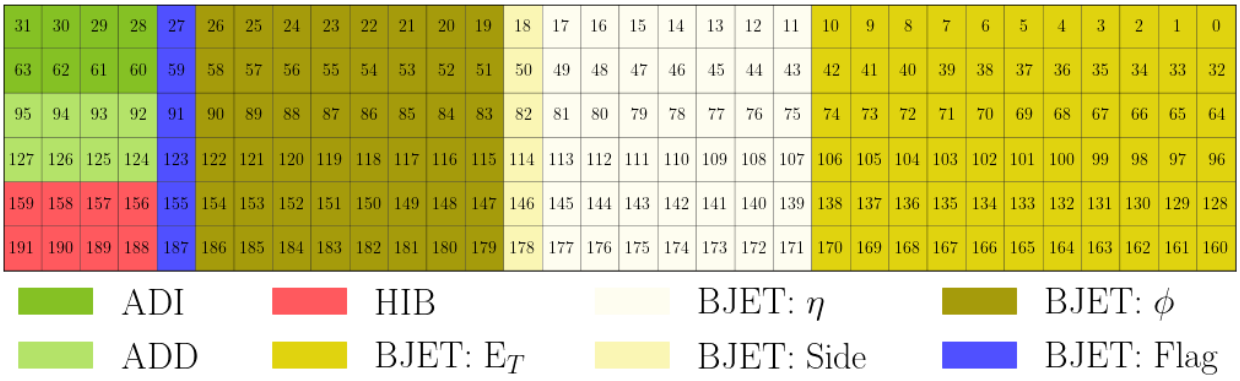

Table 5: φ scale of jet objects

HW index	**φ range**	**φ range [degrees]**	**φ bin**
0x00	0 to 2π/72	0 to 5	0
0x01	2π/72 to 2 · 2π/72	5 to 10	1
…	…	…	…
0x47	71 · 2π/72 to 72 · 2π/72	355 to 360	72

Table 6: η scale of jet objects

HW index	**η range**	**η bin**
0x00	0 to 0.0436	0
0x01	0.0436 to 0.1308	1
0x02	0.1308 to 0.218	2
0x03	0.218 to 0.3052	3
0x04	0.3052 to 0.3924	4
0x05	0.3924 to 0.4796	5
0x06	0.4796 to 0.5668	6

0x07	0.5668 to 0.654	7
0x08	0.654 to 0.7412	8
0x09	0.7412 to 0.8284	9
0x10	0.8284 to 0.9156	10
0x11	0.9156 to 1.0028	11
0x12	1.0028 to 1.09	12
0x13	1.09 to 1.772	13
0x14	1.772 to 1.2644	14
0x15	1.2644 to 1.3516	15
0x16	1.3516 to 1.4388	16
0x17	1.4388 to 1.526	17
0x18	1.526 to 1.6132	18
0x19	1.6132 to 1.7004	19
0x20	1.7004 to 1.785	20
0x21	1.785 to 1.880	21
0x22	1.880 to 1.9865	22
0x23	1.9865 to 2.1075	23
0x24	2.1075 to 2.247	24
0x25	2.247 to 2.411	25
0x26	2.411 to 2.575	26
0x27	2.575 to 2.825	27
0x28	2.828 to 999	28

Table 7: Definition of jet quality bits

bit 27	**definition**
0	TBD

1	TBD

Table 8: Data structure of a jet object

bits	**parameter**
27	quality flag
26..19	φ
18	η (side)
17..11	η
10..0	Et

Table 9: Data structure of anomaly detection bits.

bits	**description**
31..28	integer part: most significant
63..60	integer part: least significant
95..92	decimal part: most significant
127..124	decimal part: least significant

Table 10: Definition of heavy ion bits.

bits	**definition**
159..156	TBD
191..188	TBD