HS23 WL Analysis Update

Ladislav Ondris

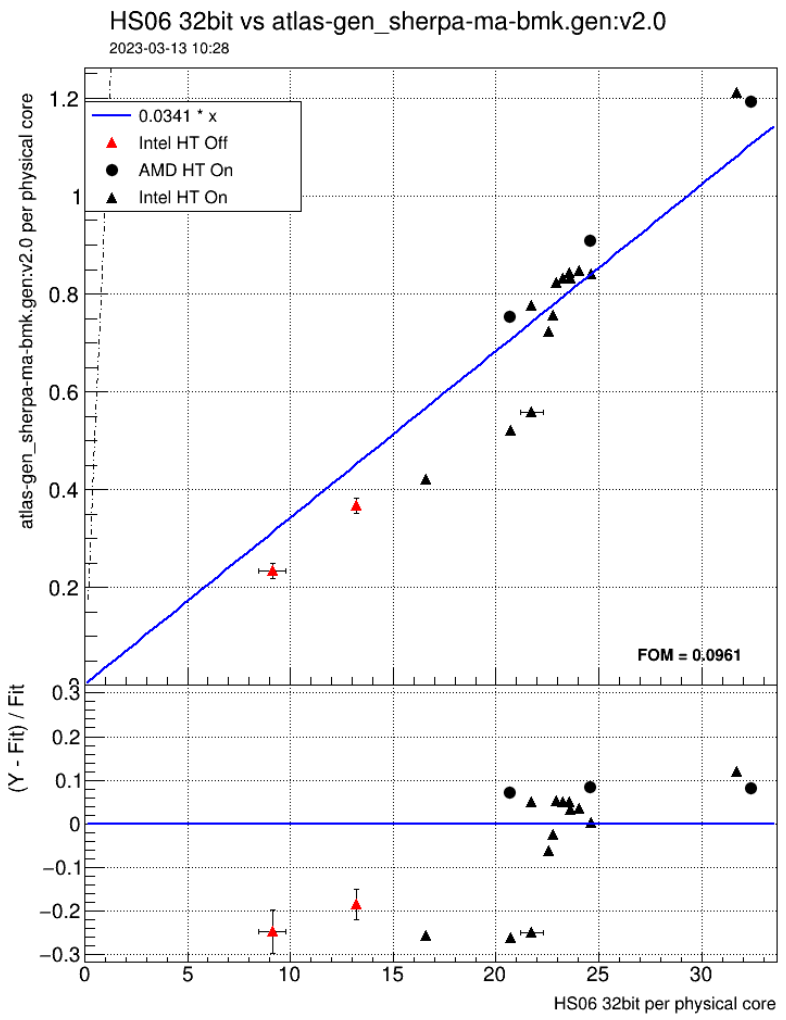
29 March 2023

HEPSpec vs. HEP-Workloads

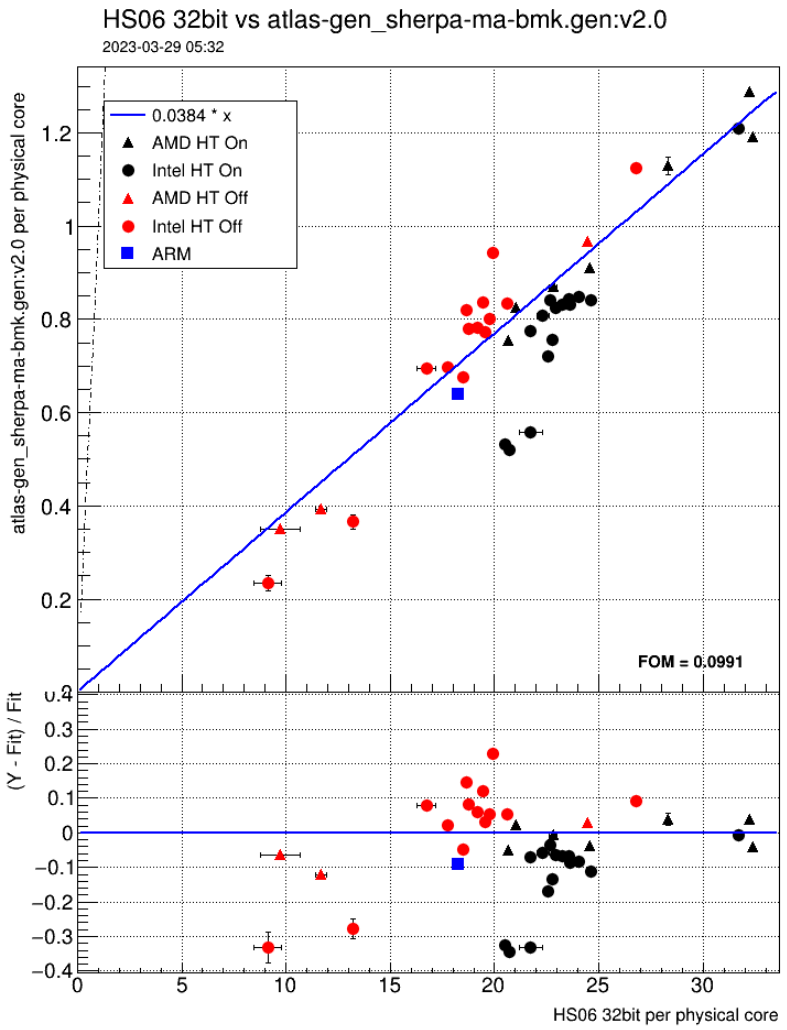
HS06 vs. HEP-Workloads

- Received new data from various sites and CPUs
- Clear difference between HT On and Off
  - higher score for HS06 when HT On
  - but similar scores for the workload
- FOM = 0.10

LAST TIME

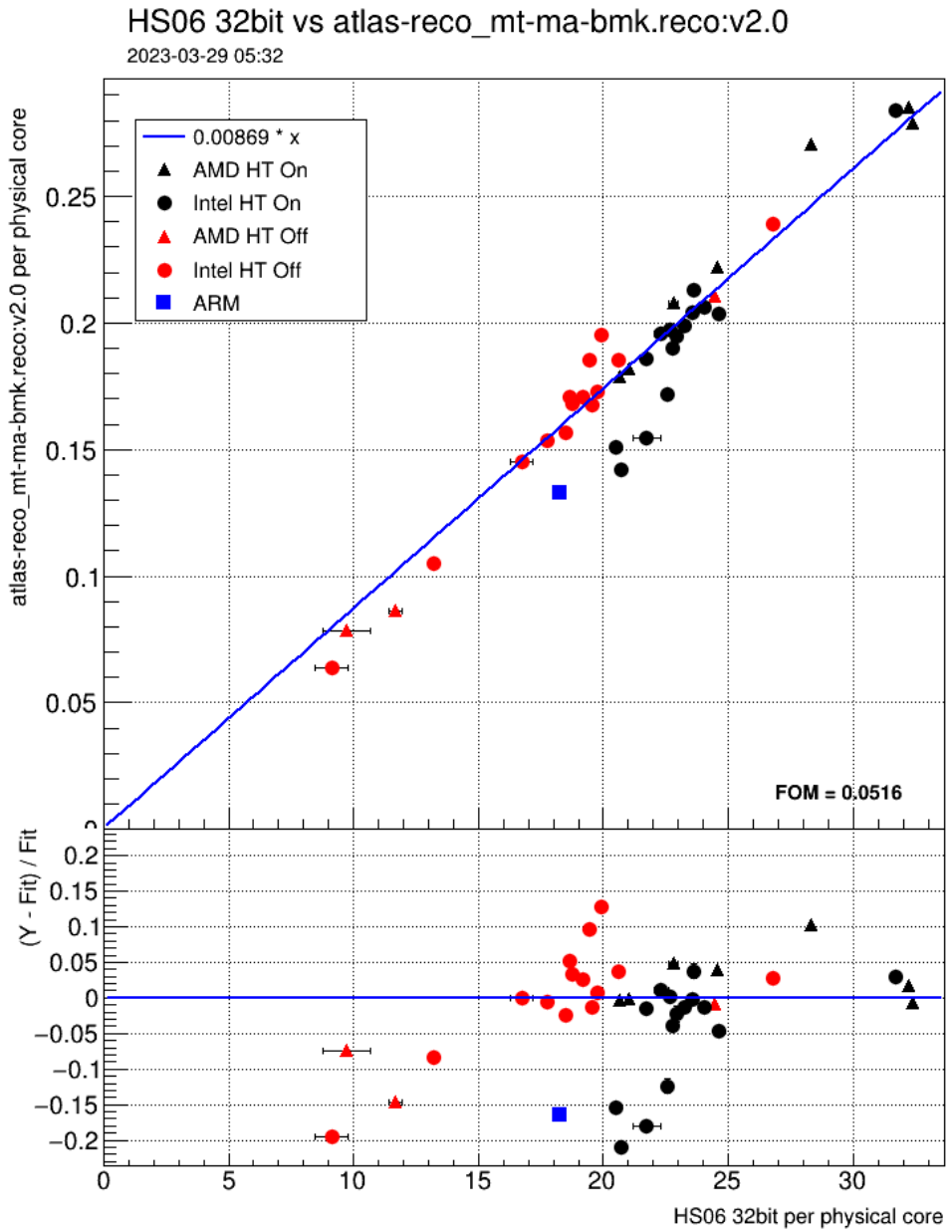


NOW



HS06 vs. ATLAS reco

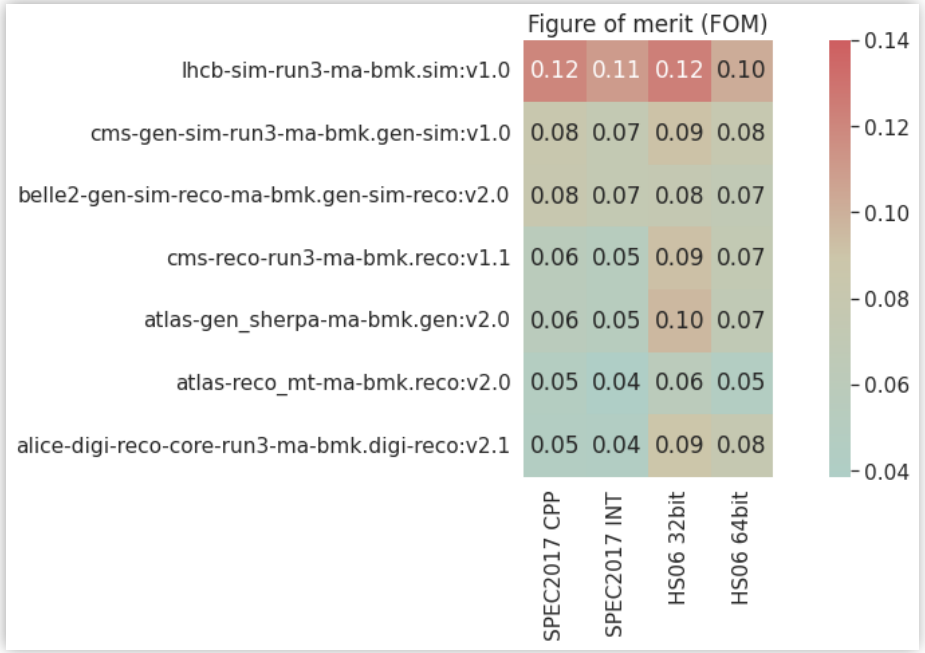
- Some workloads are more correlated with HS06
- Higher scores produced with HT On for both HS06 and ATLAS reco
- FOM = 0.05



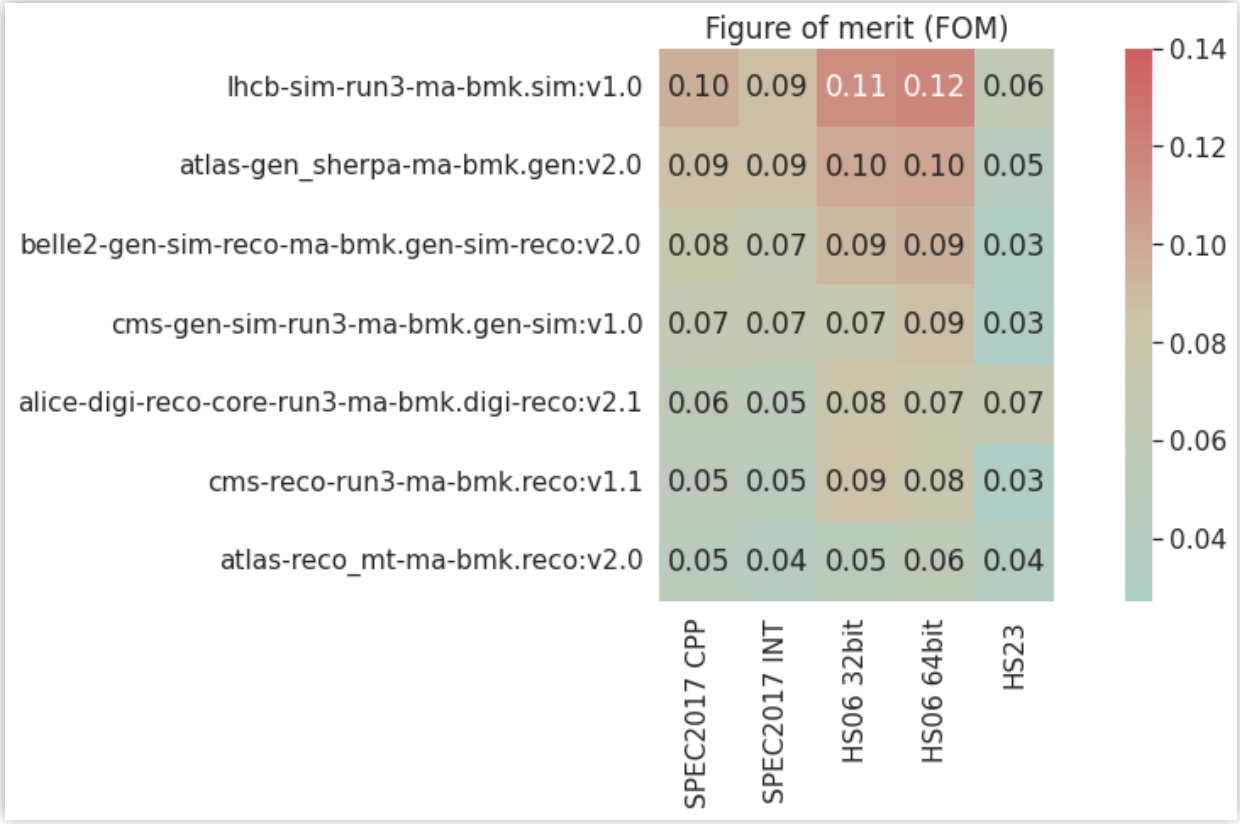
Correlations between HEP-workloads and HS06/SPEC2017

- The matrix shows similar figure of merit values as last time

LAST TIME



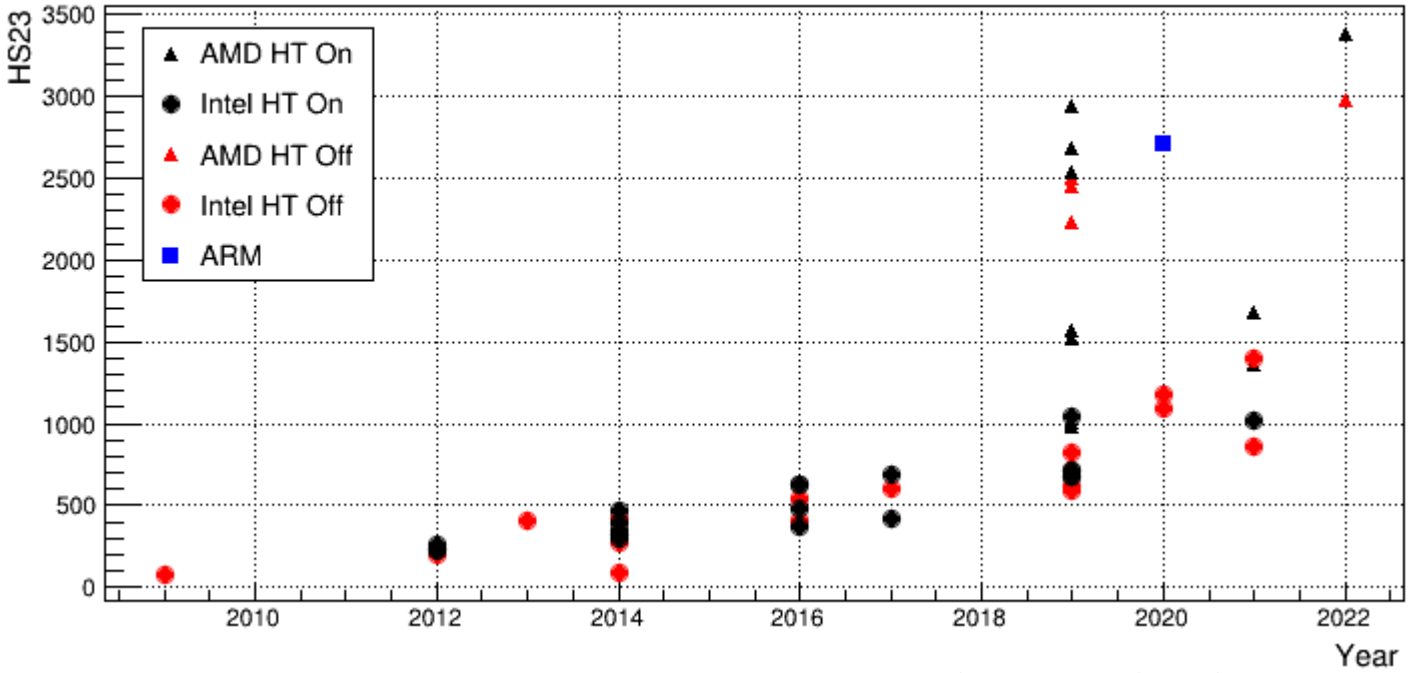
NOW



CPU Models by Year of Release

Year vs. HS23

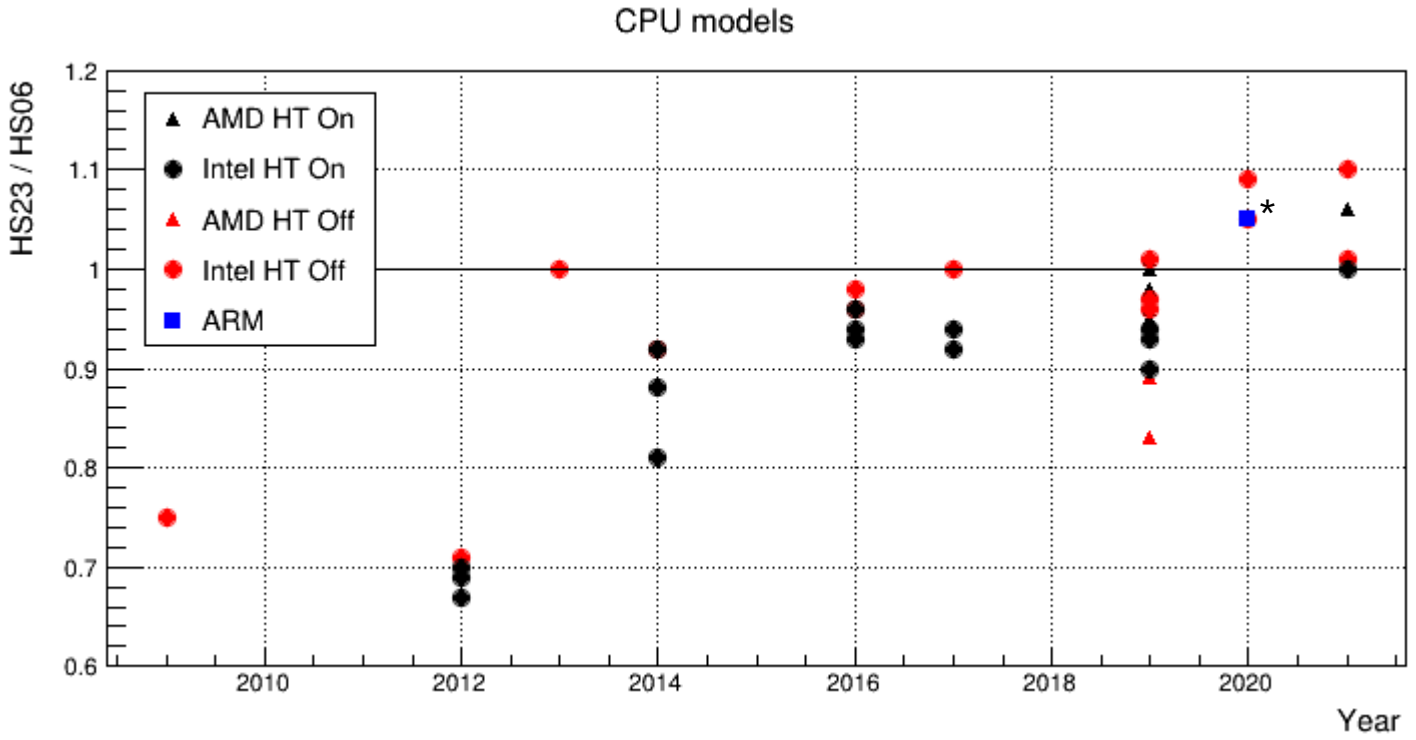
- HS23 for Intel consistently increases
- AMD's score is typically larger than Intel's due to the larger number of cores



CPU model	CPU num	Threads per core	Site	Score	Score std	Count	Year
AMD EPYC 7773X 64-Core Processor	256	2	IHEP	3387.43	4.86	26	2022
AMD EPYC 7773X 64-Core Processor	128	1	IHEP	2974.79	9.00	41	2022
AMD EPYC 7742 64-Core Processor	256	2	GridKa	2944.49	10.54	98	2019
Neoverse-N1	160	1	CERN	2713.75	7.24	36	2020
AMD EPYC 7702 64-Core Processor	256	2	IJCLAB	2690.69	11.95	16	2019
AMD EPYC 7702 64-Core Processor	256	2	GridKa	2539.81	9.19	50	2019
AMD EPYC 7742 64-Core Processor	256	1	GridKa	2501.84	13.03	23	2019
AMD EPYC 7742 64-Core Processor	128	1	SDSC	2451.37	22.45	10	2019
AMD EPYC 7702 64-Core Processor	256	1	GridKa	2229.26	4.08	5	2019
AMD EPYC 7453 28-Core Processor	112	2	CC-IN2P3	1675.02	9.63	28	2021
AMD EPYC 7452 32-Core Processor	128	2	CA-UVic-Cloud	1566.24	12.99	18	2019
AMD EPYC 7452 32-Core Processor	128	2	PIC	1516.77	4.71	20	2019
Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHz	64	1	IHEP	1403.54	2.65	12	2021
AMD EPYC 7643 48-Core Processor	96	2	UKI-SCOTGRID-GLASGOW	1357.72	1.81	12	2021
Intel(R) Xeon(R) Gold 6258R CPU @ 2.70GHz	56	1	IHEP	1182.46	2.40	12	2020

Year vs. HS23/HS06

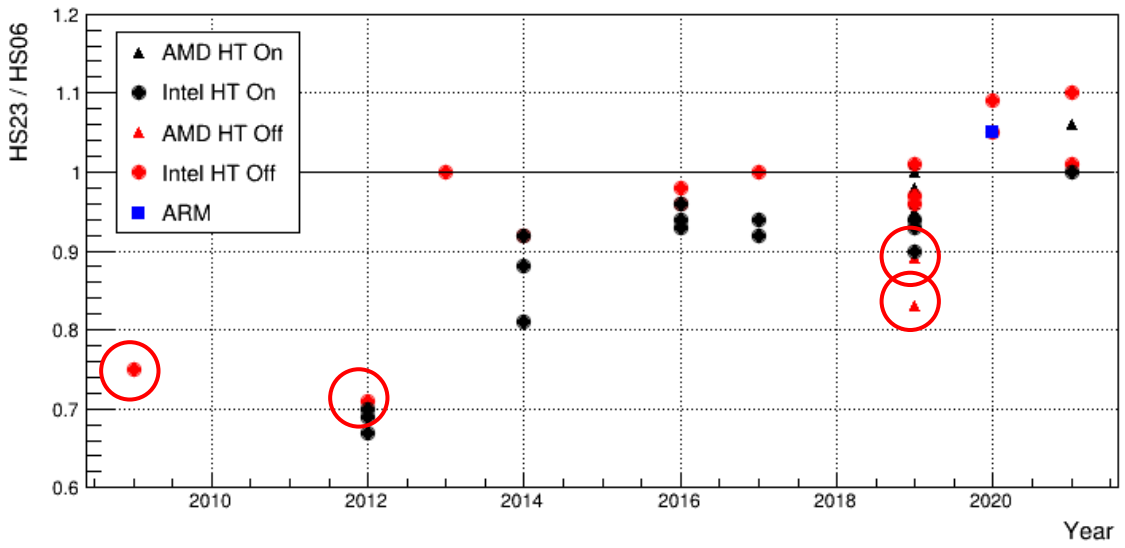
- Different trends for HT On and Off
- HT Off CPUs have values close to the reference line
  - With the exception of a few outliers
- HT On CPUs: older the model, larger the discrepancy

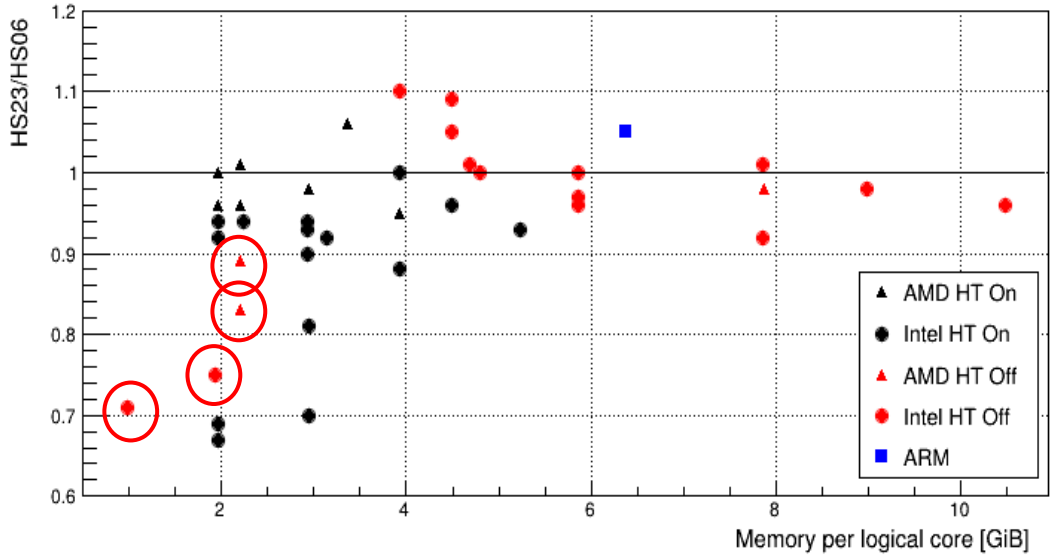


* HS06 for ARM is 64bit → compensated by a factor of 1.13
(HS06 64bit = 1.13 × HS06 32bit)

Explaining Outliers: Available Memory

- The scores of HT Off CPUs follow the reference line
- Decline in HS23 appears to occur if available memory is 2 GiB or less






CERN