

Sharing of computing resources according to the PhD fraction (October 26, 2023)

*** Using the 2023 PhD share ***

The estimate of the computing resource levels (CRL) needed by the Belle II collaboration in the years from 2024 to 2027, as presented to the BPAC, is summarized in Table 1.

	2024	2025	2026	2027
Total tape (PB)	9.6	11.8	14.8	20.1
Total disk (PB)	25	31.9	39.6	49.3
Total CPU (kHS06)	520	465	464	519

Table 1: The resource estimate for years 2024 to 2027. CPU needs drop in 2025 due to the reduced rate of data reprocessing and MC production. The storage units are PB = 10^{15} Bytes.

For JFY 2024, we propose to pledge an amount of tape, storage and CPU equal to the CRL estimated for 2024, as shown in Table 2.

	2019	2020	2021	2022	2023	2024
Total tape (PB)	10	1.4	3.2	8.8	8.6	9.6
Total disk (PB)	11	11	11	16.5	19.6	25
Total CPU (kHS06)	299	207	498	385	404	520

Table 2: CRL pledged for JFY for 2019 through 2023 and the proposal for 2024.

Each country participating to the Belle II collaboration is expected to provide a fraction of the total computing resources necessary for Monte Carlo production, skimming and analysis equal to its PhD fraction. The following tables show the amount of resources that each country should provide

Site	2024	2025	2026	2027
BNL	0.30	0.30	0.30	0.30
CNAF	0.20	0.20	0.20	0.20
IN2P3	0.15	0.15	0.15	0.15
UVic	0.15	0.15	0.15	0.15
GridKa	0.10	0.10	0.10	0.10
DESY	0.10	0.10	0.10	0.10

Table 3: Sharing of the copy of raw data (%).

The following tables give the size of pledged (JFY 2024) and planned to be pledged (JFY 2025-2027) Computing Resource Levels of the sites participating in the Belle II distributed computing effort.

Armenia	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.1	0.12	0.15	0.19
CPU (kHS06)	2.11	1.89	1.85	1.96
PhD share	0.45	0.45	0.45	0.45
Australia	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.38	0.49	0.61	0.76
CPU (kHS06)	8.42	7.54	7.38	7.86
PhD share	1.8	1.8	1.8	1.8
Austria	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.33	0.43	0.54	0.68
CPU (kHS06)	7.37	6.6	6.46	6.88
PhD share	1.57	1.57	1.57	1.57
Canada	2024	2025	2026	2027
Tape (PB)	0.37	0.53	0.76	1.15
Disk (PB)	0.71	0.92	1.16	1.47
CPU (kHS06)	19.17	15.96	16	19.43
PhD share	3.15	3.15	3.15	3.15
China	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	1.43	1.86	2.32	2.9
CPU (kHS06)	31.58	28.28	27.69	29.47
PhD share	6.74	6.74	6.74	6.74
Czechia	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.24	0.31	0.39	0.48
CPU (kHS06)	5.26	4.71	4.62	4.91
PhD share	1.12	1.12	1.12	1.12
France	2024	2025	2026	2027
Tape (PB)	0.37	0.53	0.76	1.15
Disk (PB)	0.86	1.1	1.39	1.76
CPU (kHS06)	22.33	18.79	18.77	22.38
PhD share	3.82	3.82	3.82	3.82

Germany	2024	2025	2026	2027
DESY				
Tape (PB)	0.24	0.35	0.51	0.77
Disk (PB)	2.04	2.04	2.16	2.71
CPU (kHS06)	31.47	27.43	27.09	30.34
GridKa				
Tape (PB)	0.24	0.35	0.51	0.77
Disk (PB)	2.04	2.04	2.16	2.71
CPU (kHS06)	31.47	27.43	27.09	30.34
MPI				
Tape (PB)	0	0	0	0
Disk (PB)	0.26	0.26	0.28	0.35
CPU (kHS06)	4.02	3.5	3.46	3.87
PhD share	13.03	13.03	13.03	13.03
India				
Tape (PB)	0	0	0	0
Disk (PB)	0.72	0.93	1.16	1.45
CPU (kHS06)	15.79	14.14	13.85	14.74
PhD share	3.37	3.37	3.37	3.37
Israel				
Tape (PB)	0	0	0	0
Disk (PB)	0.24	0.31	0.39	0.48
CPU (kHS06)	5.26	4.71	4.62	4.91
PhD share	1.12	1.12	1.12	1.12
Italy				
Tape (PB)	0.49	0.71	1.01	1.53
Disk (PB)	2.73	3.53	4.43	5.57
CPU (kHS06)	64.86	56.47	55.8	62.58
PhD share	12.58	12.58	12.58	12.58
KEK				
Tape (PB)	4.81	5.89	7.42	10.03
Disk (PB)	5.24	6.45	7.88	10.07
CPU (kHS06)	105.75	98.09	99.61	112.39
PhD share	18.65	18.65	18.65	18.65
Korea				
Tape (PB)	0	0	0	0
Disk (PB)	0.86	1.11	1.39	1.74
CPU (kHS06)	18.95	16.97	16.62	17.68
PhD share	4.04	4.04	4.04	4.04

Malaysia	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.05	0.06	0.08	0.1
CPU (kHS06)	1.05	0.94	0.92	0.98
PhD share	0.22	0.22	0.22	0.22
Mexico	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.29	0.37	0.46	0.58
CPU (kHS06)	6.32	5.66	5.54	5.89
PhD share	1.35	1.35	1.35	1.35
Poland	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.14	0.19	0.23	0.29
CPU (kHS06)	3.16	2.83	2.77	2.95
PhD share	0.67	0.67	0.67	0.67
Russia	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	1.29	1.67	2.09	2.61
CPU (kHS06)	28.43	25.45	24.92	26.52
PhD share	6.07	6.07	6.07	6.07
Saudi Arabia	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.14	0.19	0.23	0.29
CPU (kHS06)	3.16	2.83	2.77	2.95
PhD share	0.67	0.67	0.67	0.67
Slovenia	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.57	0.74	0.93	1.16
CPU (kHS06)	12.63	11.31	11.08	11.79
PhD share	2.7	2.7	2.7	2.7
Spain	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.05	0.06	0.08	0.1
CPU (kHS06)	1.05	0.94	0.92	0.98
PhD share	0.22	0.22	0.22	0.22

Sweden	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.19	0.25	0.31	0.39
CPU (kHS06)	4.21	3.77	3.69	3.93
PhD share	0.9	0.9	0.9	0.9
Taiwan	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.33	0.43	0.54	0.68
CPU (kHS06)	7.37	6.6	6.46	6.88
PhD share	1.57	1.57	1.57	1.57
Thailand	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.19	0.25	0.31	0.39
CPU (kHS06)	4.21	3.77	3.69	3.93
PhD share	0.9	0.9	0.9	0.9
Turkey	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.1	0.12	0.15	0.19
CPU (kHS06)	2.11	1.89	1.85	1.96
PhD share	0.45	0.45	0.45	0.45
Ukraine	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.19	0.25	0.31	0.39
CPU (kHS06)	4.21	3.77	3.69	3.93
PhD share	0.9	0.9	0.9	0.9
USA	2024	2025	2026	2027
Tape (PB)	3.1	3.42	3.88	4.66
Disk (PB)	2.72	3.46	4.29	5.37
CPU (kHS06)	66.55	57.6	57.23	65.45
PhD share	11.46	11.46	11.46	11.46
Vietnam	2024	2025	2026	2027
Tape (PB)	0	0	0	0
Disk (PB)	0.1	0.12	0.15	0.19
CPU (kHS06)	2.11	1.89	1.85	1.96
PhD share	0.45	0.45	0.45	0.45