

Sharing of computing resources according to the modified PhD fraction (May 8, 2025)

The estimate of the computing resource levels (CRL) needed by the Belle II collaboration in the years from 2026 to 2029, as presented to the BPAC, is summarized in Table 1.

	2026	2027	2028	2029
Total tape (PB)	13.5	19.1	26.1	34.4
Total disk (PB)	24.9	35.8	44.4	63.8
Total CPU (kHS23)	369	507	675	850

Table 1: The resource estimate for years 2026 to 2029. The storage units are PB = 10^{15} Bytes.

For JFY 2026, we propose to pledge an amount of tape, storage and CPU equal to the CRL estimated for 2026, as shown in Table 2.

	2019	2020	2021	2022	2023	2024	2025	2026
Total tape (PB)	10	1.4	3.2	8.8	8.6	9.6	11.8	13.5
Total disk (PB)	11	11	11	16.5	19.6	25	19.4	24.9
Total CPU (kHS06)	299	207	498	385	404	520	247	369

Table 2: CRL pledged for JFY for 2019 through 2025 and the proposal for 2026.

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. However, some countries with small Belle II groups are unable to provide sufficient resources. Their expected contributions are therefore removed. The following tables show the amount of resources that each country should provide.

Resource requirements for individual countries were also adjusted to take into account reported concerns from these countries. The assessment for Germany is adjusted to avoid a small drop in resources in 2026 which would complicate resource management at those facilities. Based on reporting from Chinese representatives, computing resource funding depends on a new five-year plan, which is not expected to be in place in the near term. The resources to be provided by China have been reduced accordingly. Russian contributions are also reduced, reflecting the lack of an MoU between Russia and KEK for Belle II M&O funding.

The Belle II Computing Steering Group encourages contributions to Data Production Expert shifts from these countries to offset their reduced contributions to physical computing resources.

The following tables give the size of planned to be pledged (JFY 2026-2029) Computing Resource Levels of the sites participating in the Belle II distributed computing effort.

Armenia	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0	0	0	0
CPU (kHS06)	0	0	0	0
Resource share	0	0	0	0
Australia	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.4	0.61	0.77	1.13
CPU (kHS06)	5.6	8.27	10.73	13.89
Resource share	1.86	1.95	1.95	1.95
Austria	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.29	0.45	0.56	0.82
CPU (kHS06)	4	5.91	7.66	9.92
Resource share	1.33	1.39	1.39	1.39
Canada	2026	2027	2028	2029
Tape (PB)	0.65	1.07	1.6	2.22
Disk (PB)	0.98	1.46	1.8	2.57
CPU (kHS06)	16.24	22.4	32.64	39.64
Resource share	3.72	3.89	3.9	3.91
China	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.25	0.25	0.25	0.25
CPU (kHS06)	10.24	13.82	15.64	20.23
Resource share	1.14	0.78	0.61	0.42
Czechia	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.23	0.36	0.45	0.66
CPU (kHS06)	3.2	4.73	6.13	7.93
Resource share	1.06	1.11	1.11	1.12
France	2026	2027	2028	2029
Tape (PB)	0.65	1.07	1.6	2.22
Disk (PB)	1.1	1.63	2.02	2.89
CPU (kHS06)	17.84	24.76	35.71	43.61
Resource share	4.25	4.45	4.45	4.46

Germany				
DESY	2026	2027	2028	2029
Tape (PB)	0.44	0.72	1.07	1.49
Disk (PB)	2.04	2.44	3.03	4.41
CPU (kHS06)	29.67	34.21	46.63	58.72
GridKa	2026	2027	2028	2029
Tape (PB)	0.44	0.72	1.07	1.49
Disk (PB)	2.04	2.44	3.03	4.41
CPU (kHS06)	29.67	34.21	46.63	58.72
MPI	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.26	0.31	0.39	0.56
CPU (kHS06)	3.79	4.37	5.95	7.5
Resource share	18.71	15.29	15.31	15.34
India	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.87	1.34	1.67	2.46
CPU (kHS06)	12	17.72	22.99	29.76
Resource share	3.98	4.17	4.18	4.18
Israel	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.12	0.18	0.22	0.33
CPU (kHS06)	1.6	2.36	3.07	3.97
Resource share	0.53	0.56	0.56	0.56
Italy	2026	2027	2028	2029
Tape (PB)	0.87	1.43	2.13	2.97
Disk (PB)	3.37	5.1	6.34	9.22
CPU (kHS06)	49.93	71.61	97.68	122.94
Resource share	14.33	15.01	15.03	15.06
KEK	2026	2027	2028	2029
Tape (PB)	6.74	9.55	13.04	17.22
Disk (PB)	6.05	8.9	11.06	15.51
CPU (kHS06)	84.1	118.54	149.87	188.74
Resource share	20.17	21.12	21.16	21.2
Korea	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.93	1.43	1.78	2.62
CPU (kHS06)	12.8	18.9	24.53	31.74
Resource share	4.25	4.45	4.45	4.46

Malaysia	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0	0	0	0
CPU (kHS06)	0	0	0	0
Resource share	0	0	0	0
Mexico	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.35	0.54	0.67	0.98
CPU (kHS06)	4.8	7.09	9.2	11.9
Resource share	1.59	1.67	1.67	1.67
Poland	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.29	0.45	0.56	0.82
CPU (kHS06)	4	5.91	7.66	9.92
Resource share	1.33	1.39	1.39	1.39
Russia	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0	0	0	0
CPU (kHS06)	0	0	0	0
Resource share	0	0	0	0
Saudi Arabia	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0	0	0	0
CPU (kHS06)	0	0	0	0
Resource share	0	0	0	0
Slovenia	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.82	1.25	1.56	2.3
CPU (kHS06)	11.2	16.54	21.46	27.77
Resource share	3.72	3.89	3.9	3.91
Spain	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0	0	0	0
CPU (kHS06)	0	0	0	0
Resource share	0	0	0	0
Sweden	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0	0	0	0
CPU (kHS06)	0	0	0	0
Resource share	0	0	0	0

Taiwan	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.47	0.71	0.89	1.31
CPU (kHS06)	6.4	9.45	12.26	15.87
Resource share	2.12	2.22	2.23	2.23
Thailand	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0	0	0	0
CPU (kHS06)	0	0	0	0
Resource share	0	0	0	0
Turkey	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.17	0.27	0.33	0.49
CPU (kHS06)	2.4	3.54	4.6	5.95
Resource share	0.8	0.83	0.84	0.84
UK	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0.12	0.18	0.22	0.33
CPU (kHS06)	1.6	2.36	3.07	3.97
Resource share	0.53	0.56	0.56	0.56
Ukraine	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0	0	0	0
CPU (kHS06)	0	0	0	0
Resource share	0	0	0	0
USA	2026	2027	2028	2029
Tape (PB)	3.69	4.53	5.58	6.83
Disk (PB)	3.74	5.52	6.81	9.76
CPU (kHS06)	58.09	80.7	110.67	136.84
Resource share	14.6	15.29	15.31	15.34
Vietnam	2026	2027	2028	2029
Tape (PB)	0	0	0	0
Disk (PB)	0	0	0	0
CPU (kHS06)	0	0	0	0
Resource share	0	0	0	0