

# **Status Report on KLOE Data Reconstruction October 2002**

**Data taking in Y2002**

**Data Reconstruction**

**DST production**

**Monte Carlo**

**Offline farm upgrades**

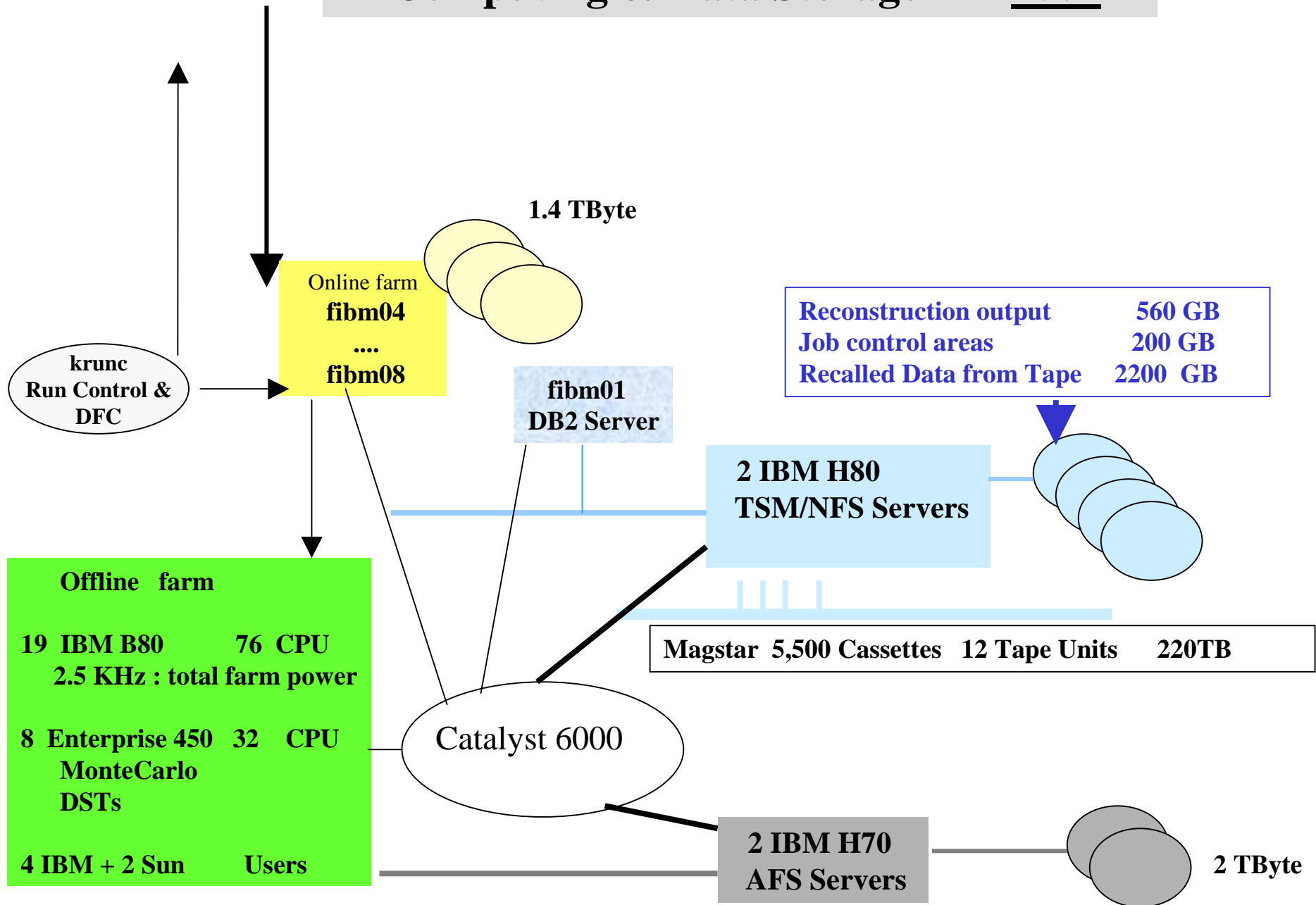
**Jobs**

**Summary**

**C.Bloise Oct ,10<sup>th</sup>**

# Computing & Data Storage

2002



# Offline Farm

**Total Computing Power -  $28 \times 4 = 112$  CPU H80-equivalent**

<b>20%</b>	<b>Users</b>	<b>23 CPUs</b>
<b>12%</b>	<b>MonteCarlo</b>	<b>13 CPUs</b>
<b>68%</b>	<b>Data Reconstruction</b>	<b>76 CPUs</b>

**Data Reconstruction 02 : 47 triggers/s/CPU    35 fully efficient CPUs always used**

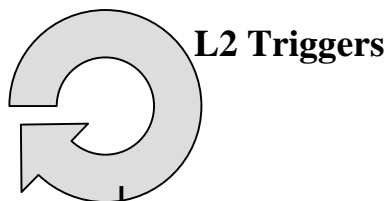
**Total Power                    3,000 triggers/s    >6 pb<sup>-1</sup> / day**

<b>Trigger Composition</b>	<b>0.23</b>	<b>Bhabha + <math>\Phi</math></b>	<b>0.70</b>	<b>CPU-power</b>
	<b>0.55</b>	<b>Cosmics + background rejected</b>	<b>0.05</b>	<b>CPU-power</b>
	<b>0.22</b>	<b>Cosmics + background tracked</b>	<b>0.25</b>	

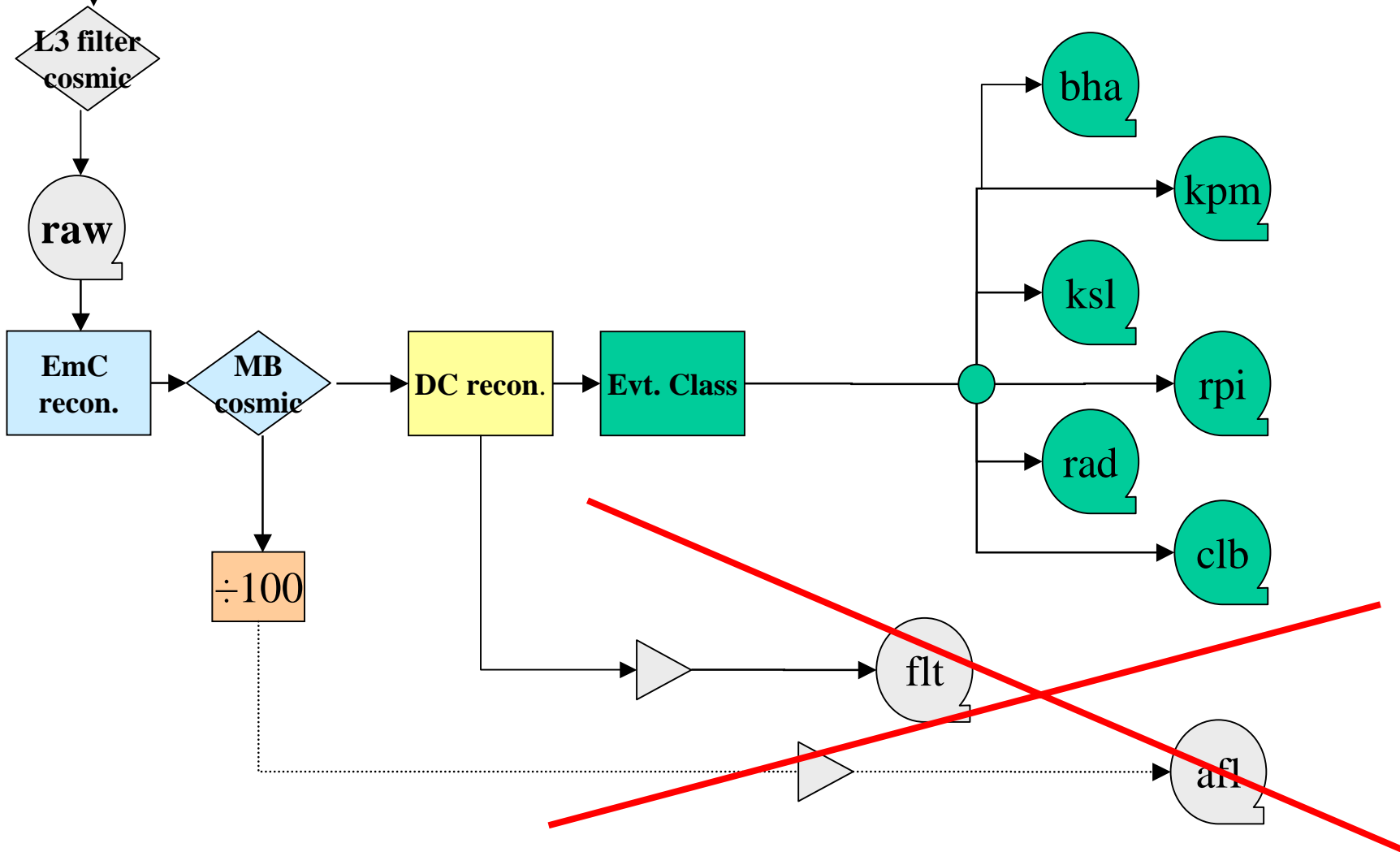
**Next year , with the same background content we expect:**

**@ L × 2        34 triggers/s/CPU    55 fully efficient CPUs needed**

**@ L × 3        28 triggers/s/CPU    80 fully efficient CPUs needed**



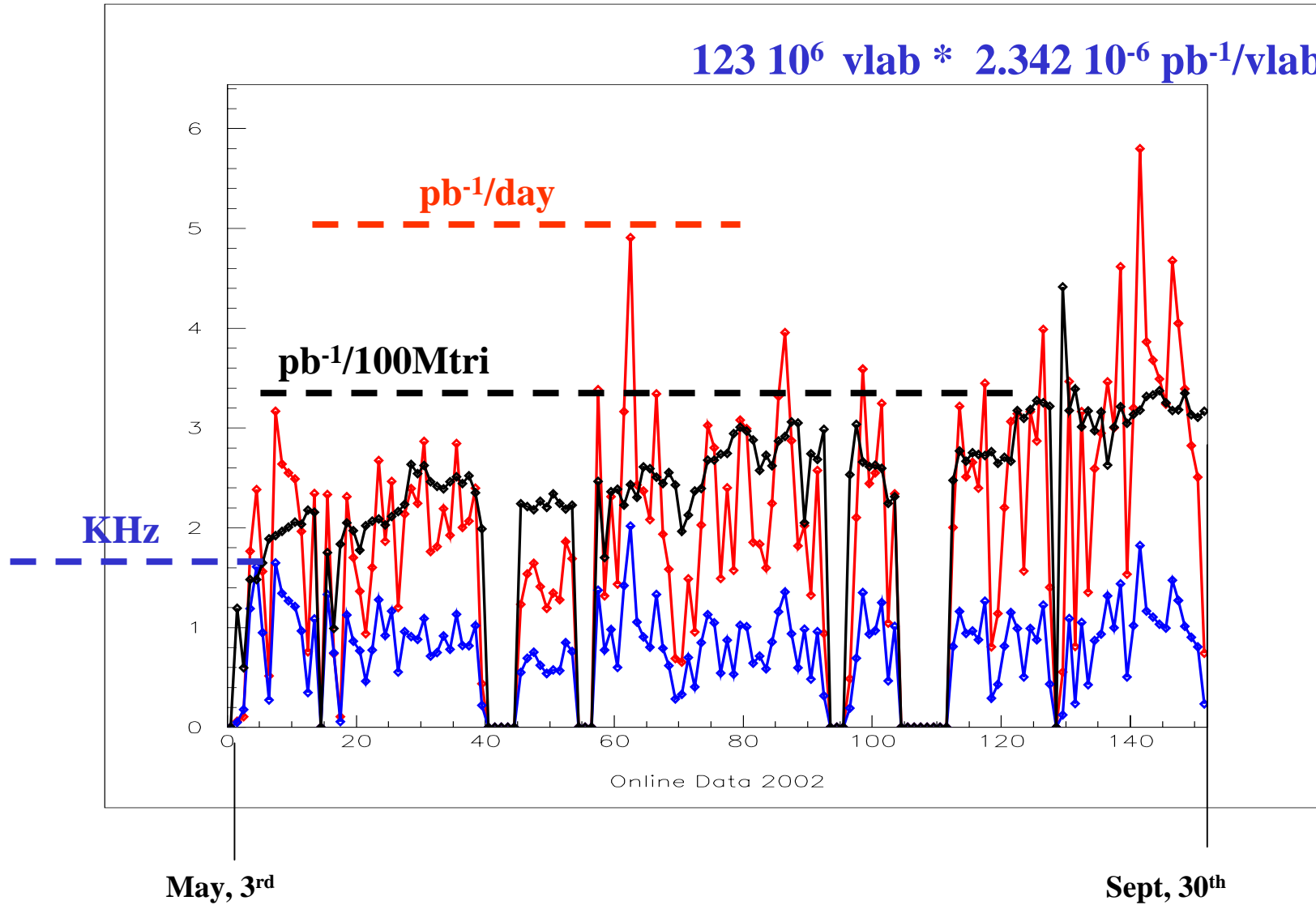
# Reconstruction



# Day by day 2002 Data Reconstruction

288 pb<sup>-1</sup> - 131 days - 10<sup>10</sup> triggers

123 10<sup>6</sup> vlab \* 2.342 10<sup>-6</sup> pb<sup>-1</sup>/vlab



## KLOE – Archived Data    October 02

	<del>1999 - Raw</del>	<del>6 Tbytes</del>
~20 pb <sup>-1</sup>	2000- Raw	22 Tbytes
	2000- Reconstructed	12 Tbytes
~180 pb <sup>-1</sup>	2001- Raw	48 Tbytes
	2001- Reconstructed	37 Tbytes
~288 pb <sup>-1</sup>	2002- Raw	33 Tbytes
	2002- Reconstructed	26 Tbytes

**178 Tbytes/ 184 TB available**

## DSTs for the analyses

Besides the reconstructed data sample, the DSTs are produced, with a selected information content reducing by a factor of 10 the data volume for the analyses.

These files are created immediately after the data reconstruction completion to take advantage of the availability of the files on disk.

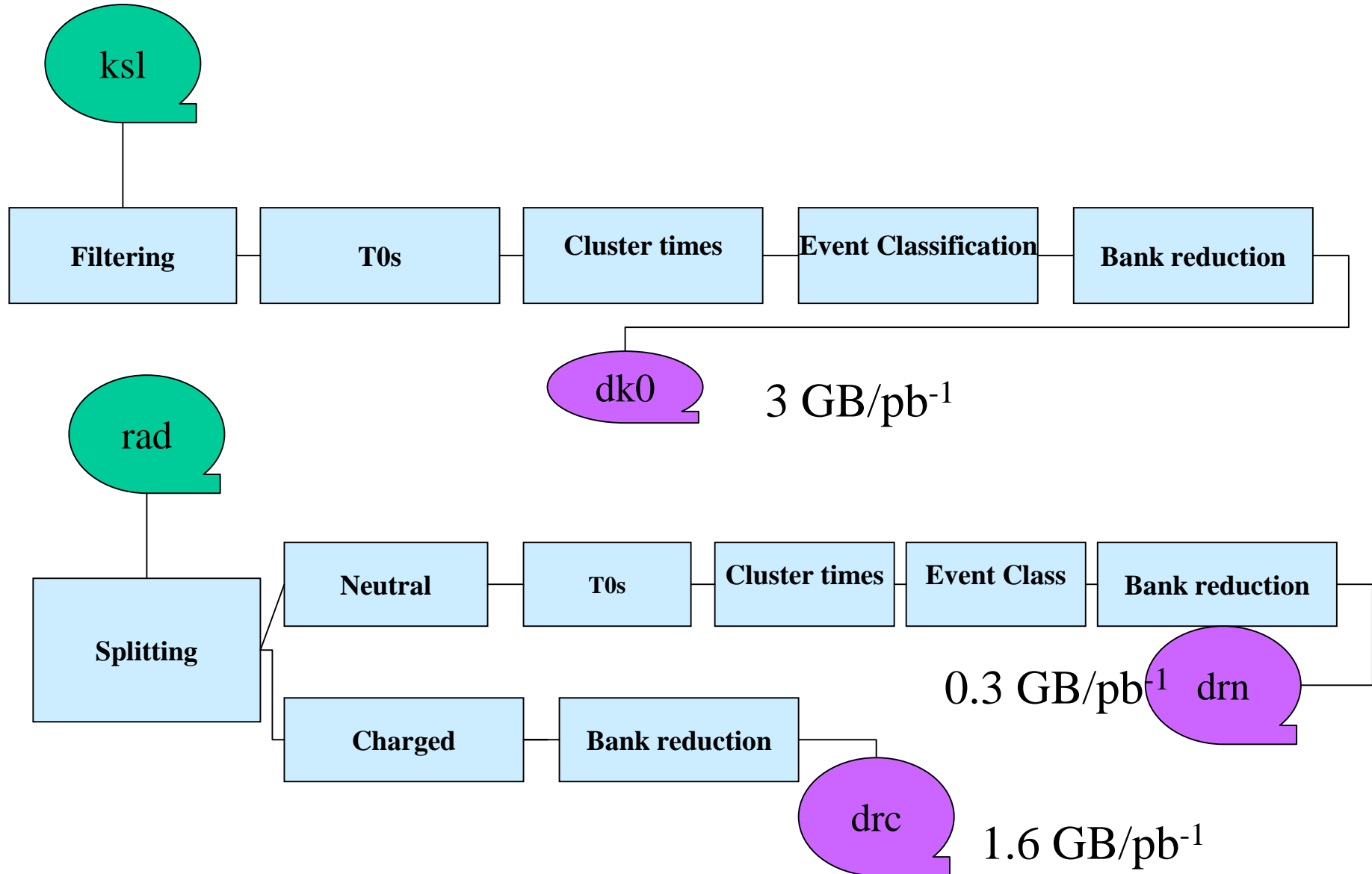
Excluding the charged kaon DSTs, that do not exist so far, we have a total of 5.2 GB/pb<sup>-1</sup> as DST volume.

The charged kaon DSTs will have both, the biggest event size, and the largest event sample:

$$10^6 \text{ events/pb}^{-1} \times 5 \text{ KBytes/event, e.g. } 5 \text{ GBytes/ pb}^{-1}$$

1.4 TBytes of disk space devoted now to DSTs on the new servers. This space is needed for an efficient multi-user access to the data.

# DSTs





# DSTs

**DSTs production for charged kaons includes the event re-tracking.**

**To complete 20-25 pb<sup>-1</sup> per day**

**5 CPUs are needed to filter and  
40 CPUs to track the events**

**Data throughput requested by the CPUs is 5-7 MB/s**

## DSTs

<b>Year/DBV</b>	<b>Recon Lumi pb<sup>-1</sup></b>	<b>KSL DSTs pb<sup>-1</sup></b>	<b>RPI DSTs pb<sup>-1</sup></b>	<b>RAD DSTs pb<sup>-1</sup></b>
<b>2001/12</b>	<b>64.6</b>	<b>63.5</b>	<b>6.0</b>	<b>44.4</b>
<b>2001/13</b>	<b>99.0</b>	<b>99.0</b>	<b>46.7</b>	<b>99.0</b>
<b>2001/14</b>	<b>4.5</b>			
<b>2002/13</b>	<b>66.8</b>	<b>56.7</b>		<b>27.2</b>
<b>2002/14</b>	<b>213.3</b>	<b>213.3</b>		<b>213.3</b>

# Monte Carlo

- 8 Sun-Enterprise 450 are dedicated to Monte Carlo generation and reconstruction
- Event production is based on procedures based on the information (random seeds, input cards, job status ,...) in the DB
- Computer power correspond to  $2.5 \rightarrow 4 \cdot 10^6$  events per day
- The most demanding task is the study of the background topologies
- Work done recently
  - $12 \cdot 10^6$  of  $\Phi$  decays (  $4 \text{ pb}^{-1}$ )
  - $49 \cdot 10^6$  of  $K_S \rightarrow \pi^+\pi^-$  decays (  $73 \text{ pb}^{-1}$ )
  - $25 \cdot 10^4$  of  $K_S \rightarrow \pi^+\pi^-\pi^0$  decays
  - $15 \cdot 10^5$  of  $K^+ \rightarrow \pi^+\pi^0\pi^0$  decays (  $44 \text{ pb}^{-1}$ )
  - $5 \cdot 10^5$  of  $\Phi \rightarrow \pi^+\pi^-\pi^0$  decays
  - $1 \cdot 10^6$  of  $e^+e^- \rightarrow e^+e^-$

# Monte Carlo

- DST production for the Monte Carlo samples
- Few  $\times 10^8$  events, 10-15 Kbytes/event
- (1.2 Tbytes/ $10^8$  events) is the data volume
- 2 MB/s will be required and processed by each CPU
- 200,000 events/h/CPU can be processed .

## Job List

- Event Reconstruction
- DST production for charged kaons
- Monte Carlo generation on IBM
- Monte Carlo production ~500 Mevents
- DST production for the Monte Carlo samples
- Machine Background Simulation

# SUMMARY

## Disk space :

Multi-user access to DSTs requires additional disk space by the end of the year  
5 Tbytes + MonteCarlo DSTs ( few Tbytes) expected by the end of the year.  
1.2 Tbytes available now. Further 3(?) Tbytes by the end of the year.

## Library :

98% Full.

The upgrade of the tape drives ( next month ?) will increase the total capacity by 50%.  
110 Tbytes will be available for storaging at the end of migration ( few months ?)  
New storage solutions are under study for the year 2003 data taking.

## Computing Power :

It is enough for the online reconstruction ( up to  $x2.5 L_{2002}$ ), DST production, to generate MonteCarlo samples and to perform the ongoing analyses.  
It is marginal for any complete-reprocessing campaign.