Monte Carlo simulations of the DØ detector

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1 Monte Carlo simulations of the DØ detector

DØ is one of the experiments at the Tevatron collider in Fermilab. The detector used by D0 to detect high energy collisions is very complicated apparatus. Good understanding of detector operation and effects is essential for each physics analysis. Proper detector understanding can be obtained by comparison of collected data characteristics to those expected from theory represented by Monte Carlo simulations.

A huge amount of simulated data is needed for this purpose, so that several PC farms were setup in collaborating countries around the world to achieve desired computing power. One of these simulation centers is located in Prague and has about 5 % of the total CPU power dedicated for D0 simulations.

1.1 Prague center

The Prague center computing power was doubled in the year 2002. The 32 procesors (PIII 700MHz, 1GB RAM) located in Prague was followed by another 32 procesors (16 dual procesor computers with PIII 1GHz, 1GB RAM and one master station) in Plzen.

Using all this power, we have generated about 1 million events during the year 2002, about 800.000 of them were transfered to Fermilab for further analysis and 200.000 so called minimum bias events were stored on local fileserver for further use in simulations. This corresponds to about 1 TB of data produced by METACENTRUM farms.

The use of METACENTRUM computing resources was limited by very frequent updates of simulation software and updates of farms software itself.

1.2 Presentation

Our results are regularly presented on DØ collaboration meetings. The talks are available from Prague center web page

http://www-hep2.fzu.cz/d0/mcc/D0simPrague.html