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To,
The Director
INFN Bologna
Viale Carlo Bertini Pichat
Bologna 40127, Italy

Sir,

This mail is in reference to the completion of my two years post doctoral fellowship at Bologna section of INFN. Please find a brief summary of my work done during the duration of my fellowship.

I got an opportunity to work on CDF experiment at Fermilab. I took the leading role in CDF grid development and data analysis. Since CDF has recently changed and improved its computing model, decentralizing some parts of it in order to be able to exploit the rising number of distributed resources available nowadays. Despite those efforts, while the large majority of CDF Monte Carlo production has moved to the Grid, data processing is still mainly performed in dedicated farms hosted at FNAL, requiring a centralized management of data and Monte Carlo samples needed for physics analysis. This rises the question on how to manage the transfer of produced Monte Carlo samples from remote Grid sites to FNAL in an efficient way; up to now CDF has relied on a non scalable centralized solution based on dedicated data servers accessed through rcp protocol, which has proven to be unsatisfactory.

I proposed a new data transfer model that uses SRMs as local caches for remote Monte Carlo production sites, interfaces them with SAM, the experiment data catalog, and finally realizes the file movement exploiting the features provided by the catalog data transfer layer. **Accepted for publication in Journal of Physics: Conference Series, CHEP 309.**

Under physics data analysis, I used dijet mass differential cross section for search of compositeness. The measurement of the dijet mass differential cross section is sensitive to the presence of new high mass particles decaying into dijets. Many classes of particles in beyond the standard model scenarios have a larger branching fraction into two partons (quarks and gluons) than into modes containing leptons, photons and electroweak gauge bosons, and they are expected to make a resonant structure in the dijet mass spectrum. Searches for compositeness in the dijet mass spectrum is challenging due to a large contribution from direct two-jet production via quantum chromodynamics interactions; however, the previous observation of W and Z bosons decaying into dijets by the UA2 Collaboration showed the feasibility of finding dijet mass resonance at hadron colliders. **Results presented in APS Conference at Denver, Colorado, April, 2009.**

Our group has considerable experience in extracting physics from minimum bias data. I also tried to evaluating the contribution of heavy flavor hadrons especially from bottom and charm quarks in the minimum bias data. The present HF tagger algorithm is not suited for minimum bias data due to presence of very low P_T particles. I re-wrote the HF tagger algorithm for our case and found that the results are encouraging. This analysis is under progress now.

I am thankful to you and Prof. Franco Rimondi for providing an excellent environment for research during my stay at INFN Bologna.

Yours Faithfully,

Dr. Manoj Kumar Jha