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# CORELib: COsmic Ray Event Library

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CORELib is a collection of simulated showers induced by primary cosmic rays and a common framework to produce and manage such large production. Indeed, CORELib provides high statics background simulation for various astroparticles and astronomy experiments. The simulations are obtained employing widely used CORSIKA simulation framework and the GRID infrastructure as computational resources; in the current productions the observation level is placed at sea level, while the Standard European Atmospheric Model is used. The parameters of simulations are available and easily accessible to the users. Two different primary energy spectra are considered: one with -2 spectral index and one with flat spectrum. Four different high energy models are evaluated: QGSJET01 with CHARM option, QGSJET01 with TAULEP option, QGSJETII with TAULEP option and EPOS with TAULEP option. The common low energy model chosen is GHEISHA. Protons and Heavy Nuclei (He, C, N, O, Fe) induced showers are simulated. Proton induced showers two production are available: with and without Cherenkov radiation. All the information about every single shower is stored in SQLite database queryable by the user. In order to simplify the access at the library, a dedicate tool named CORANT is used to translate from binary to ASCII the CORSIKA output files. The information about showers is placed in separated files, one for each particles class (EM, Hadrons, Muons, Neutrinos ). The whole production of CORELib will be stored at the CNAF, the Information Technology national center of INFN (Italian Institute for Nuclear Physics) . It can be downloaded through gridFTP with X509 certificate.

## Summary

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**Session Classification:** Applications and requirements of CORSIKA

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