

# AMS-02 Computing & Software News

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- AMS Software Updates

- 2006 MC Production

- GEANT4 AMS Simulation Status

- Minor Updates in RICH & Root Sections;
- Major Update in TOF/ACC Section. New version of TOF/ACC offline software is released. It includes the following major changes:
  - In program for generation of the MC reference distributions of photon transit time from particle impact point to TOF counter PMT:
    - \* More realistic bended shape of light guides for TOF counters in layers 2 and 3 was implemented; the logic of photon interactions with PMT window and cathode was improved.
    - \* TOF counter's "surface imperfection" parameter was preliminary tuned using the measurements of effective light attenuation length (available from production quality tests DB). Due to the big variations of measured values the final tuning can only be done during the tests with assembled

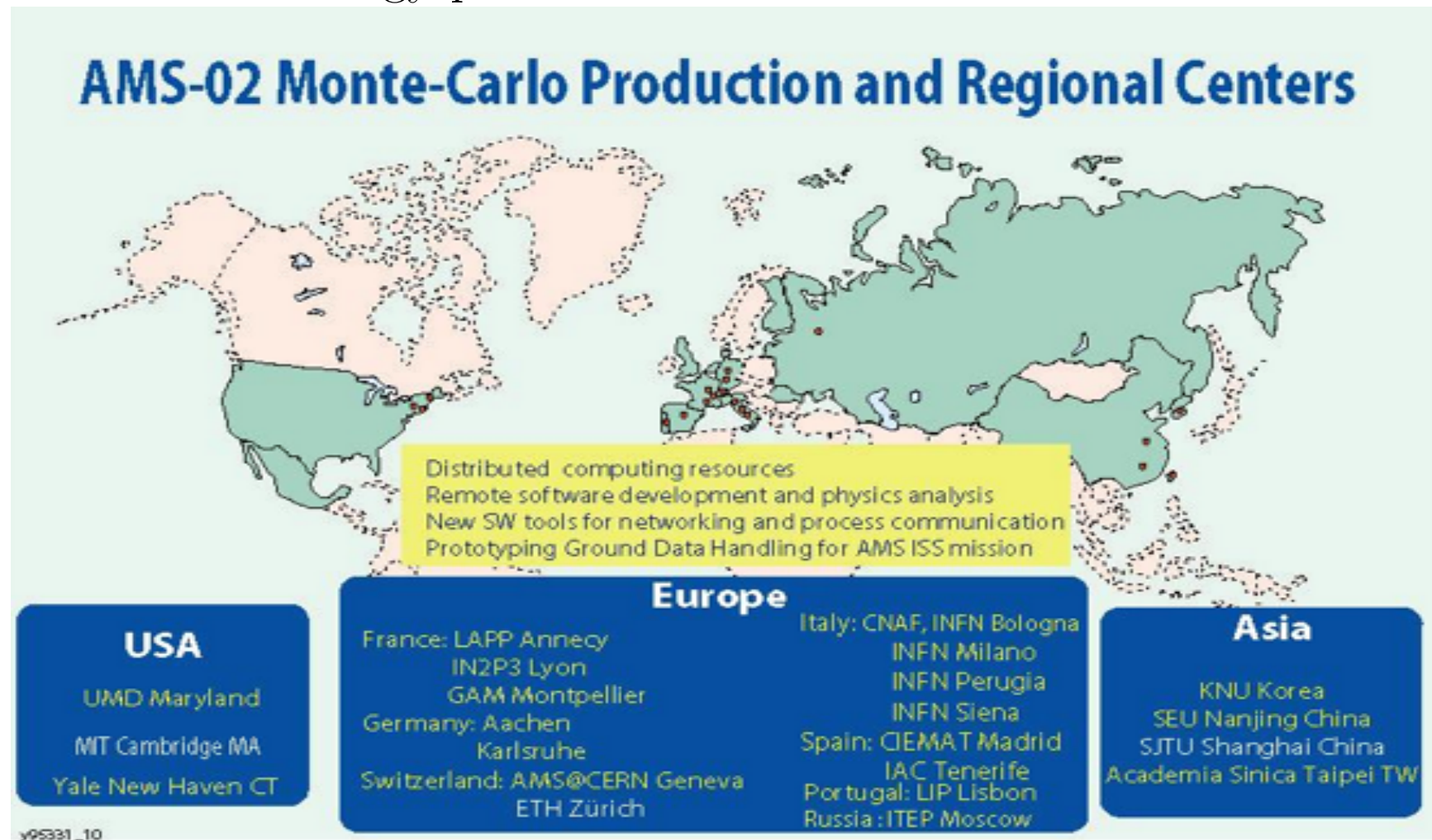
AMS.

- \* Finally the complete set of new reference distribution files was created to be used by TOF offline simulation program.
- In offline simulation/reconstruction program:
  - \* TOF/ACC simulation/reconstruction software logic was modified to follow the new readout logic (new design of SFET/SFEA boards). The treatment of new "half plane" time history channels was added.
  - \* Individual setting of PMT single photoelectron gain and gain variations was implemented for each TOF counters logical group. TOF side signals were equilized to have the same value (for the moment 200 mV amplitude at discriminator input).
- Above changes affect most of the TOF-calibration parameters. So the complete set of standard calibration files was recreated to update the necessary parameters.

- As the result of some changes and tunings the TOF-determined particle velocity resolution is about 10% worse than in previous version of program ( i.e about 3.6% for singly charged relativistic particles).
- This new version of TOF/ACC software is the basis for the future development (hopefully the main features of readout logic are now fixed). But some changes and tunings can not be excluded when the necessary tests of new SFET/SFEA boards will be performed.

Started July 2006

Includes low energy protons & electrons AMS02 Simulation



- AMS Simulation successfully runs with latest Geant 4.8.1 framework, featured:
  - Custom built TR engine;
  - Modified Cerenkov routines to properly include mirror reflection;
- First observations:
  - Fast initialization phase (was  $\approx 5$  minGhZ);
  - Event Simulation phase still about 5-10 times slower than GEANT3;
  - ECAL response still  $\approx 20\%$  higher than G3 one;
  - TRD simulation is very slow, but comparable with G3 one;
  - Some tuning is needed for RICH simulation.
- Wanted: Volunteers to carefully check/compare with GEANT3/tune subdetectors responses.