Pierre Auger Observatory

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The VO auger manager

- PAO

- Motivations for the grid computing

- Production experience

- VRC

1 600 detectors
3 000 km²

NORTE

COIHUECO

MORADOS

LEONES

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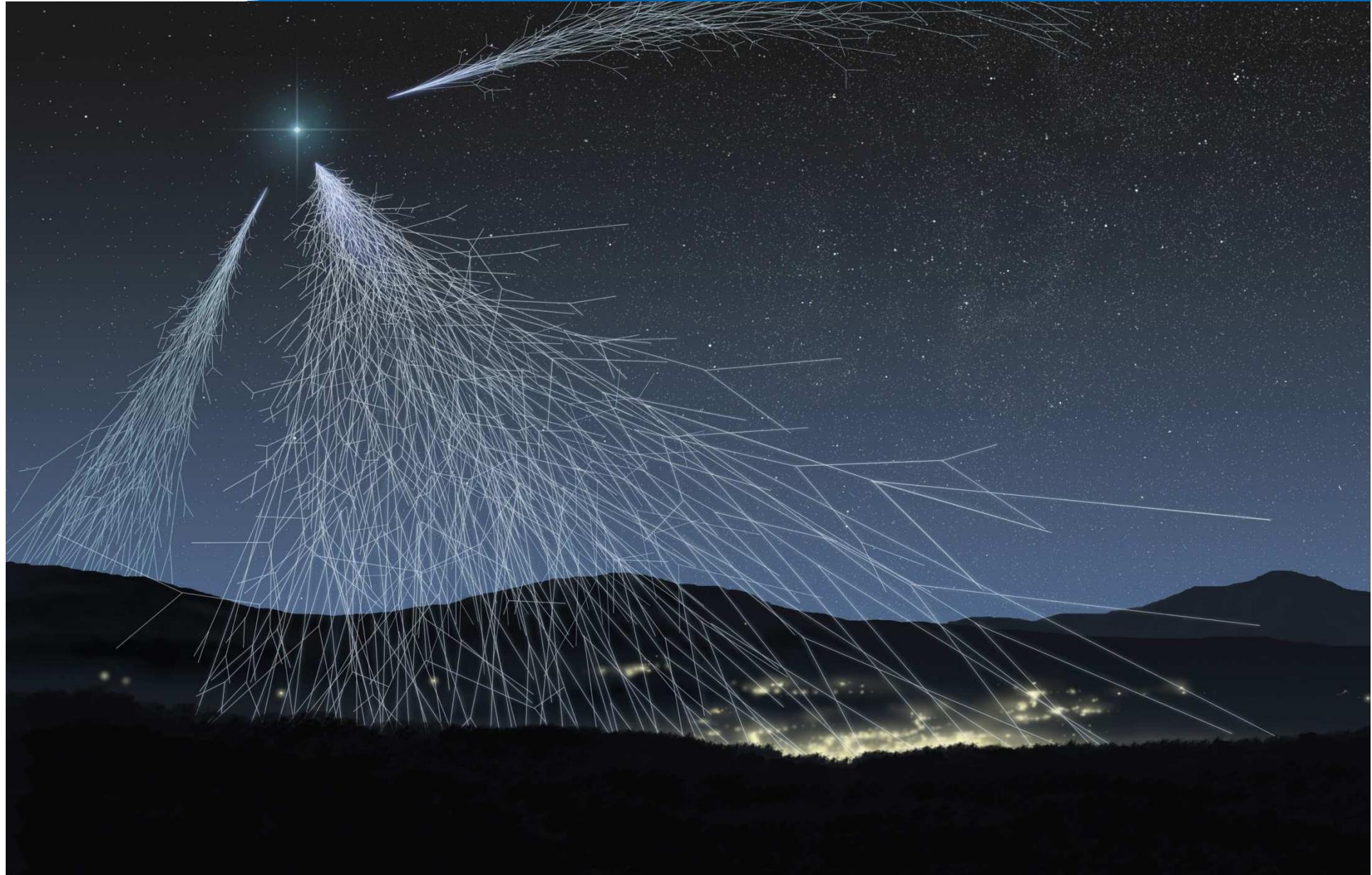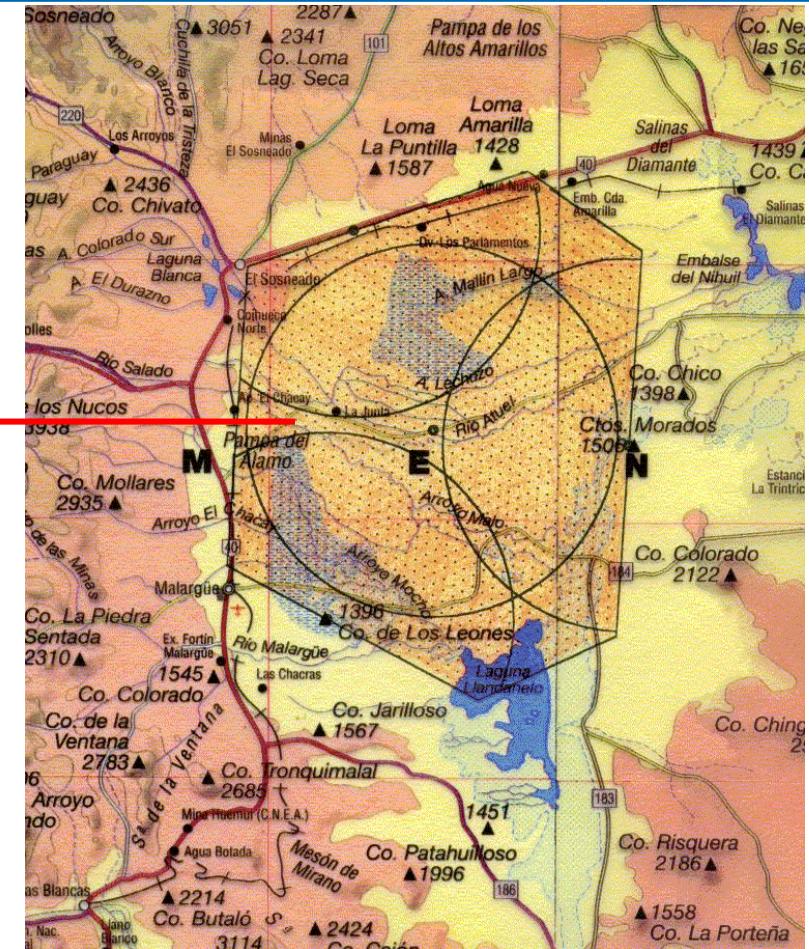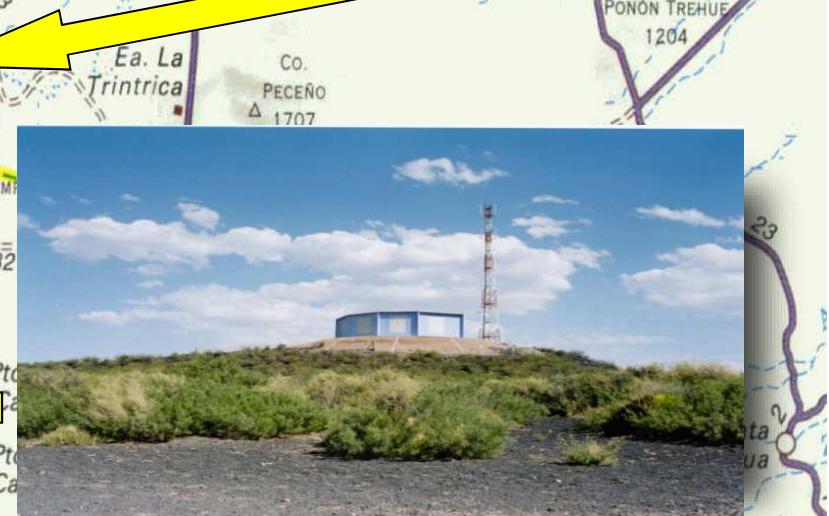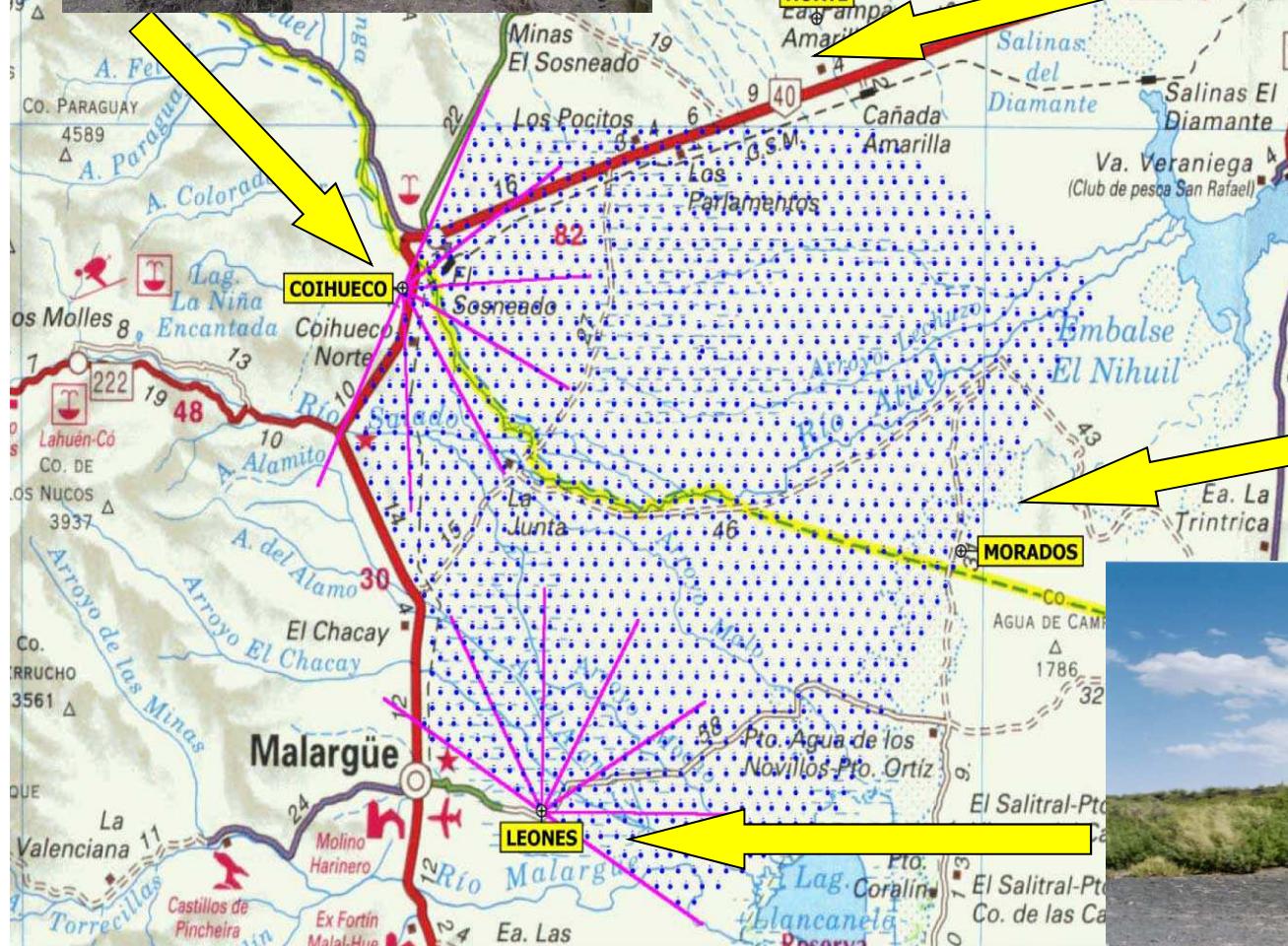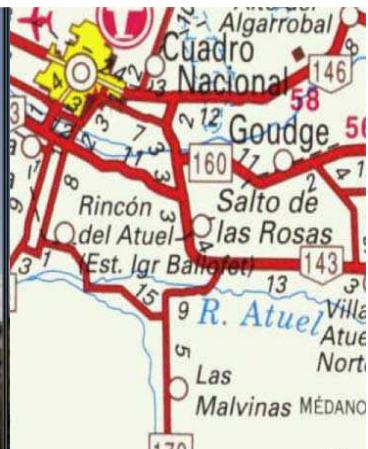
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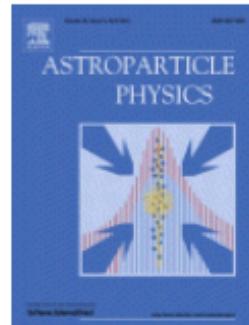
1. **Search for first harmonic modulation in the right ascension distribution of cosmic rays detected at the Pierre Auger Observatory**
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3. **Detection of high-energy solar neutrons and protons by ground level detectors on April 15, 2001**
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   Muraki, Y.; Matsubara, Y.; Masuda, S.; Sakakibara, S.; Sako, T.; Watanabe, K.; Butikofer, R.; Fluckiger, E.O.; Chilingarian, A.; Hovsepyan, G.; Kakimoto, F.; Terasawa, T.; Tsunesada, Y.; Tokuno, H.; Velarde, A.; Evenson, P.; Poirier, J.; Sakai, T.
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- About 500 members from more than 111 institutes from 18 countries

Participating countries:

Argentina, Australia, Bolivia, Brazil, Czech Republic, France, Germany, Italy, Mexico, Netherlands, Poland, Portugal, Slovenia, Spain, United Kingdom, USA and Vietnam

- **Monte Carlo simulations of showers**
  - CORSIKA program with several models
  - Tens of CPU hours for highest energies
  - Different energy bins, angles, models, chemical composition
- **Simulated data distribution**
- **Uniform access to resources**
- **Increase available resources**

NB: No real data on the grid – local sites (CCIN2P3 and Fermilab) are sufficient

COUNTRY Total elapsed time per VO
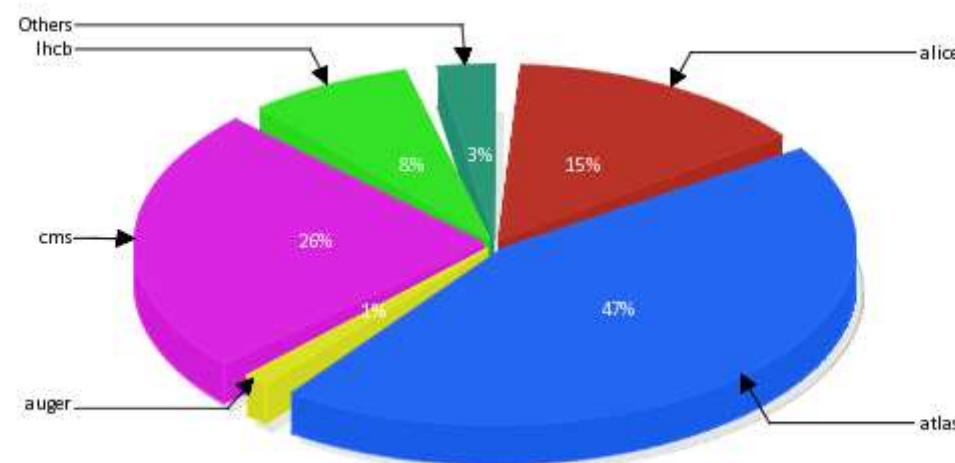
© CESGA EGI View: COUNTRY / sumelap / 2011:1-2011:12 / VO-DATE / top10 (x) / ACCBAR-LIN / i

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VO auger was the biggest EGI grid user after the 4 LHC VOs

Astrophysics Total elapsed time per VO
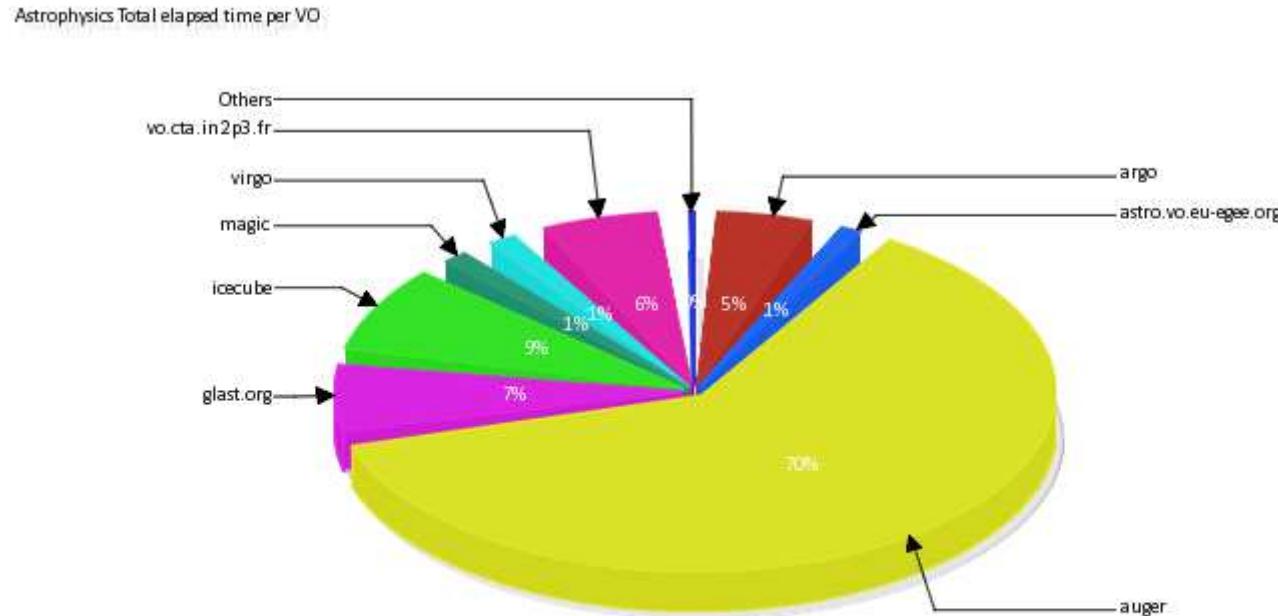
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Credits:

    Production team from Granada university
    CESNET – running central services (VOMS, LFC)
    Sites and site admins – provide resources

Similar results in 2012

Astrophysics Total elapsed time by VO and DATE.
Production Sites. January 2012 - February 2012.

The following table shows the distribution of Total elapsed time grouped by VO
and DATE for **Production** sites.

VO	Jan 12	Feb 12	Total	%
argo	77,315	2,961	80,276	1.84%
astro.vo.eu-egee.org	0	0	0	0.00%
auger	1,527,233	1,409,791	2,937,024	67.46%
glast.org	114,807	72,007	186,814	4.29%
icecube	447,335	404,501	851,836	19.57%
inaf	11	12	23	0.00%
lofar	39	11	50	0.00%
magic	9,356	9,508	18,864	0.43%
pamela	3,624	7,702	11,326	0.26%
planck	0	0	0	0.00%
virgo	2,229	0	2,229	0.05%
vo.apc.univ-paris7.fr	0	0	0	0.00%
vo.cta.in2p3.fr	32,089	185,100	217,189	4.99%
vo.helio-vo.eu	0	0	0	0.00%
vo.hess-experiment.eu	1	47,896	47,897	1.10%
vo.paus.pic.es	0	0	0	0.00%
Total	**2,214,039**	**2,139,489**	**4,353,528**	
Percentage	**50.86%**	**49.14%**		

Total elapsed time [units Hours] by VO and DATE for Production sites
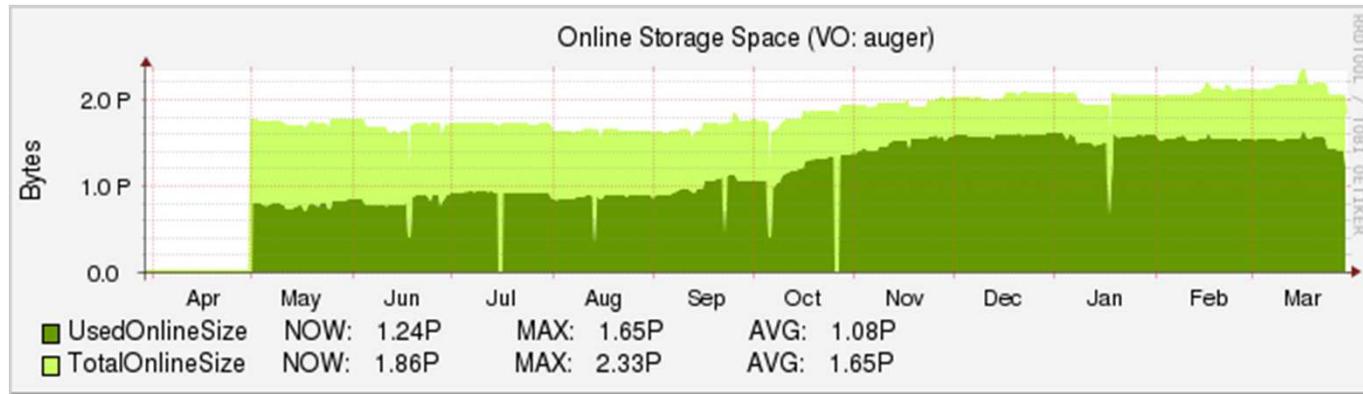
Gstat value: 2 PB
Real value: 300 TB

- Many job slots available
- Storage shortage
  - Overfilling of some sites
- High level tools were missing
  - Now we have second generation of custom tools for semiautomatic production
- Reliability increases
- **Requires continuous effort**
- Site admins ask for a membership

- Grid access too complicated for some users
  - Certificate; UI ready for all VO users;
  - Certificate change – file ownership problem
- Copies of output files also available via SRB, accessible with the local account in CC IN2P3
- Some users very active
  - Lots of jobs, lots of small files
- 3 day sw tutorial planned for June in Prague
  - grid tutorial included

Expectations from the VRC

- Forum for placing requirements
- Better documentation (from both sides)
- Custom procedures
  - SLA with sites, different policies
- Additional manpower for solving concrete problems
- Easier negotiations with sites

- PAO management in favour
- Suggested MoU relatively "heavy"
    - many topics, many contact persons
    - several persons found within the collaboration
- Cooperation with other AA projects welcome (Corsika simulations planned by more projects)