

# Moroccan ATLAS GRID MAGRID



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**International ICFA Workshop on HEP Networking,**

**Grid and Digital Divide Issues**

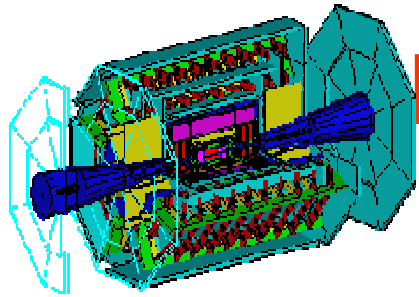
**For Global e-Science**

**May 23 – 27, 2005**

**Daegu, Korea**



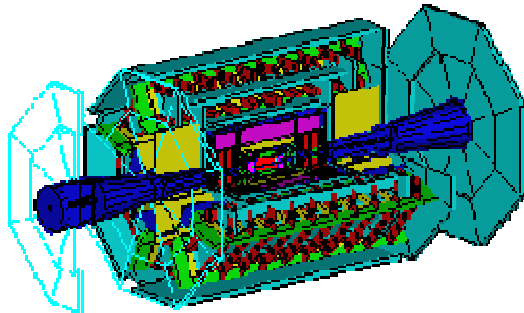
**A. Hoummada 23-28 May Korea**



# Moroccan ATLAS GRID MAGRID



- **1996** Morocco joins ATLAS experiment
- **Organization: High Energy Physics Network - RUPHE**
  - **6 Universities** : Casablanca, Rabat, Marrakech, Oujda, Settat, Mohamedia
    - CNESTEN : Center for Nuclear Physics
  - 20 physicists
  - 10 Graduate Ph.D Students
  - 15 students : Master of HEP & Informatics



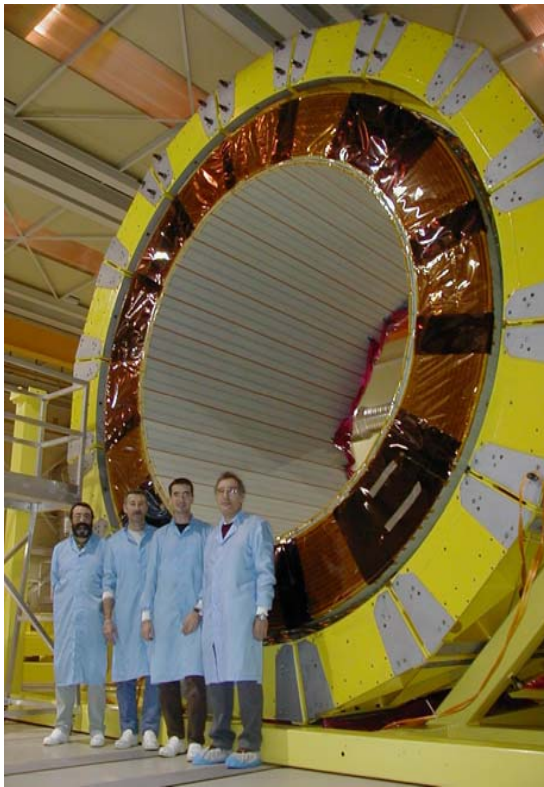
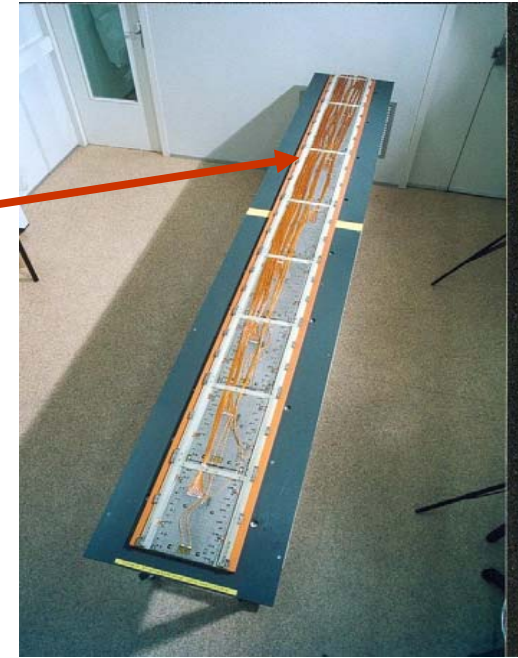
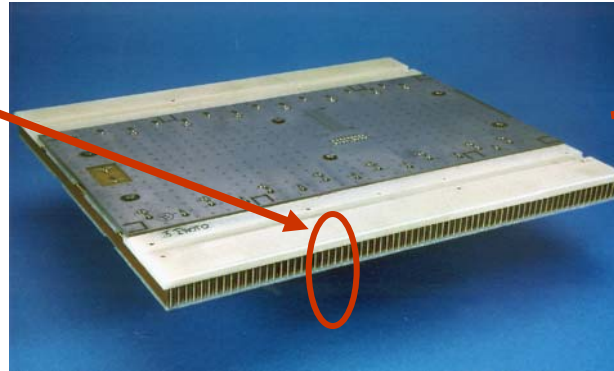
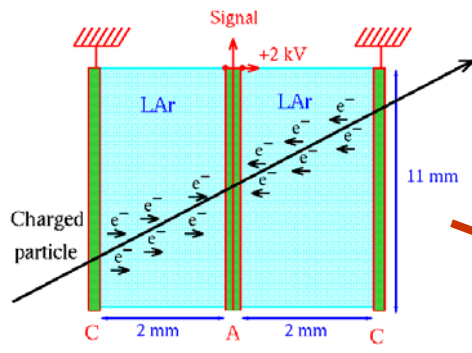
## Morocco In ATLAS

### *Computing activities*

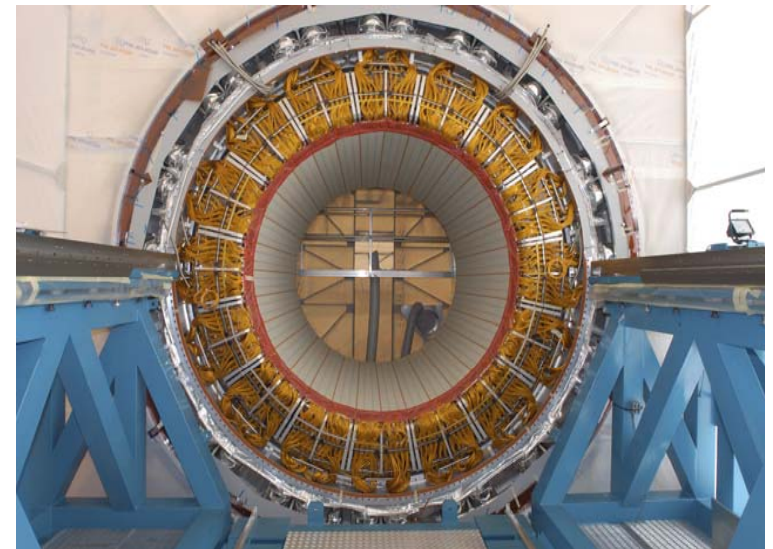
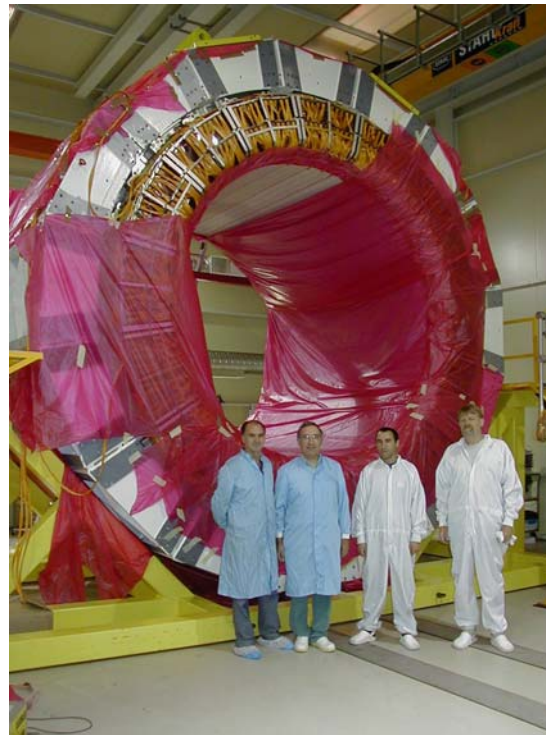
- Construction (LPSC-Grenoble and KTH-Stokholm) of the **ATLAS electromagnetic calorimeter presampler** from 1998 to 2003
- Physics simulation
- Test beam (shifts, assembling, insertion, ...)
- Analysis of combined test beam data
- **GEANT4** : Performance studies, simulation and reconstruction
- Others ATLAS software : ATHENA, EMTB, ...
  - **New activity** : Detector conception and design in the International Linear Collider (**ILC**) **framework ?**

# Presampler of the ATLAS E.M. Calorimeter

Grenoble (LPSC) – Stockholm  
and Morocco



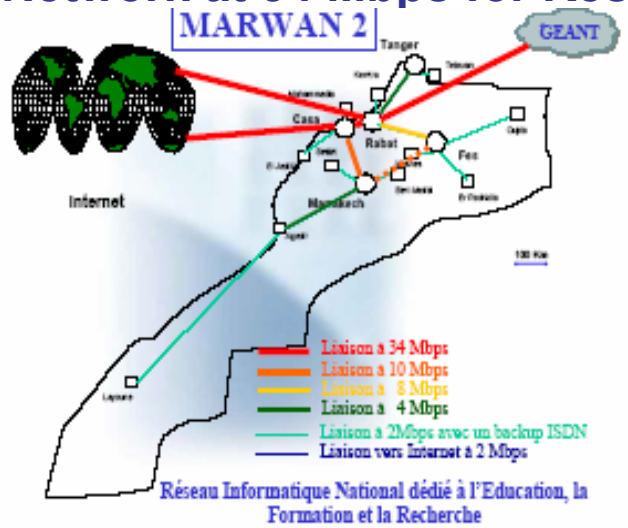
1 wheel of 32 sectors



# Maroc Wide Area Network MARWAN 2



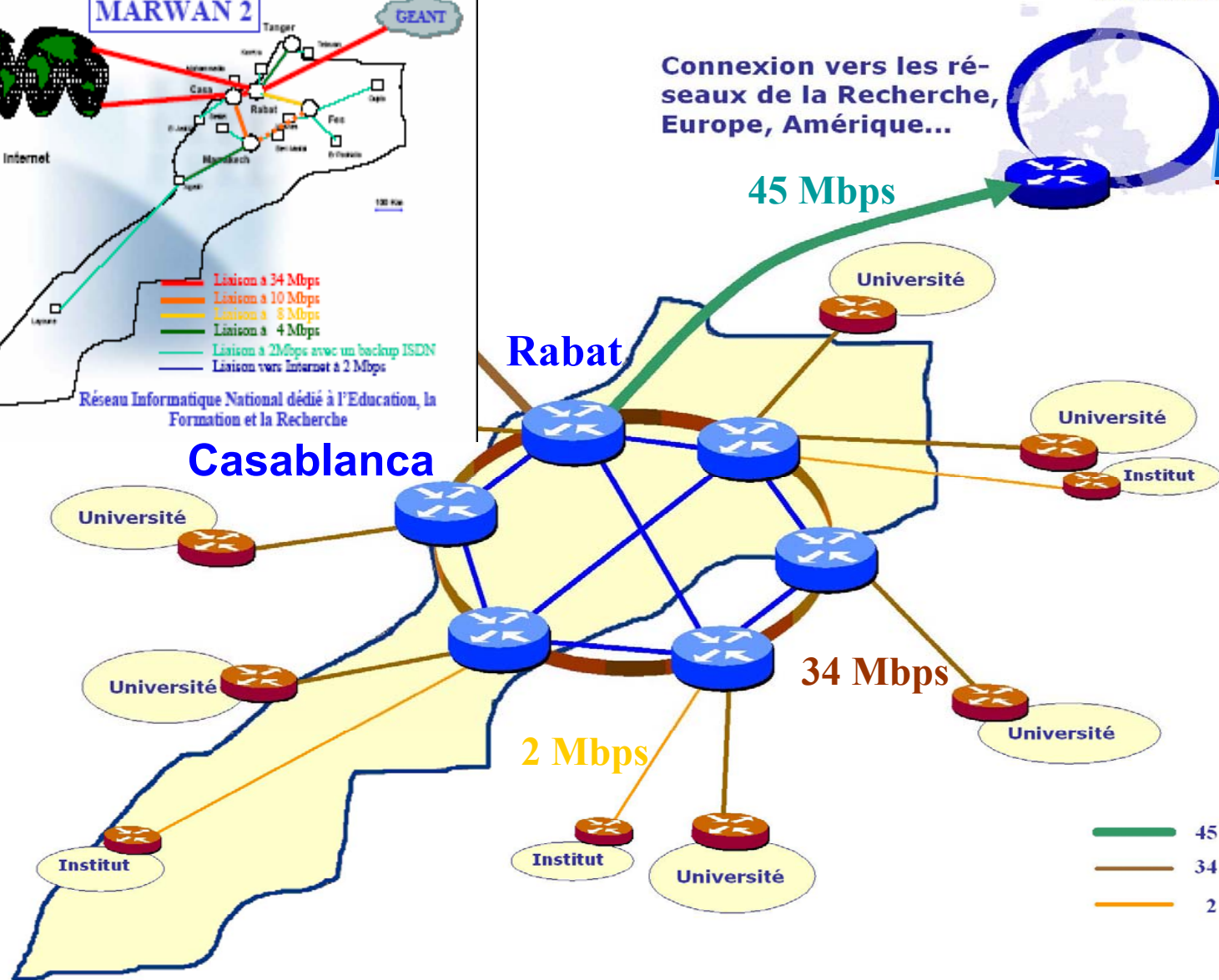
Network at 34 Mbps for Research and high education



Connexion vers les réseaux de la Recherche, Europe, Amérique...

Réseau GEANT

Algeria & tunisia  
connected to  
Geant - 45 Mbs



- 45 Mbit/s
- 34 Mbit/s
- 2 Mbit/s

## Institutions connected to MARWAN 2

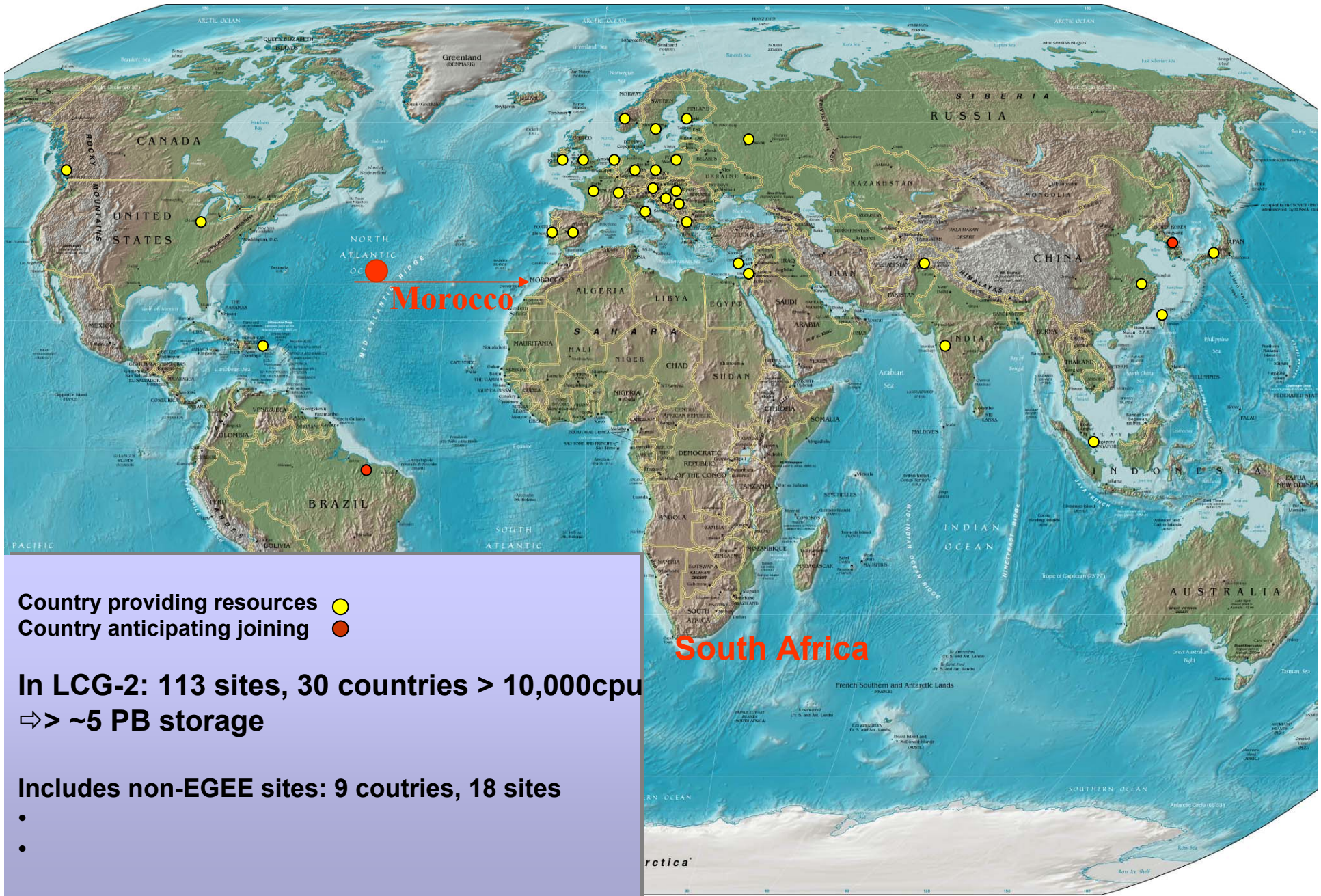


- 27 Links to MARWAN 2
- (19 @ 2 Mbps + 8 @ 34 Mbps ) March 2005

<b>Institutions</b>	<b>connected</b>	<b>Total</b>	<b>%</b>
<b>Universities</b>	<b>11</b>	<b>14</b>	<b>79%</b>
<b>Faculties and Institutes</b>	<b>63</b>	<b>80</b>	<b>79%</b>
<b>researchers (universities)</b>	<b>8300</b>	<b>9740</b>	<b>85%</b>
<b>Students (universities)</b>	<b>196841</b>	<b>240660</b>	<b>82%</b>

### **Some Characteristics of Digital Divide in Morocco :**

- **MARWAN2 @ 34 Mbps (many cases @ 2 Mbps)**
- **Majority of links University – Institutes are @ 2 Mbps (cost is about 2000 Euros per month)**
- **Monopoly of one operator Maroc-Telecom**
- **Problem of Manpower and organization**
- **poor participation in large scientific collaborations (LHC, ...), Moroccan HEP network in ATLAS is unique example in Africa**



Country providing resources ●  
 Country anticipating joining ●

In LCG-2: 113 sites, 30 countries > 10,000cpu  
 ⇨ ~5 PB storage

Includes non-EGEE sites: 9 countries, 18 sites

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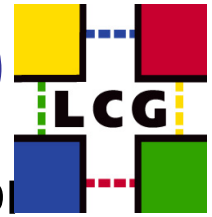
# Computing and equipement



- Analysis of the combined test beam data : July-October 2004
  - 7.7 Million events fully simulated (Geant 4)
  - 22 Tbyte of data
- Slow progress using interactive data analysis at CERN
- Necessity of using **Gridftp** for data transfer
- Joining **LCG** is a matter of urgency for us
- Existing cluster at the Casablanca site
  - 6 CPUs (2.4 GHz) with 512 MB of RAM
  - 10 CPUs ( 2.4 GHz) with 256 MB of RAM
  - Storage capacity about 700 GB
  - Operating system is Linux RedHat Enterprise WS3 and Fedora and Linux scientific



# Joining LHC computing Grid (LCG)



- **Joining LCG** : Memorandum Of Understanding (MOU) for Collaboration in the Deployment and exploitation of the LHC computing Grid , autumn 2005
- Building a **Morocco tier-2 federation** including the institutions of the HEP network.
  - Casablanca, Rabat, Oujda, Marrakech, Settat, CNESTEN and CNRST**CNRST : National Center for Scientific and Technologic Research**
- In 2006 extension of the existing cluster of Casablanca
  - Linux farms of PC clusters
  - 15 CPUs (2. GHz) 1 GB of RAM
  - Storage capacity of 3 Tbytes
- An other Cluster at CNRST (Rabat) dedicated to **EUMEDconnect** and **LCG** will be equiped in the beginning of 2006, with roughly the same equipments as Casablanca
- **In november 2005** : Training course on network security and Grid. B. Boutrain from LPSC/Grenoble - IN2P3

## Morocco Tier2 federation supported by CC-IN2P3 Tier1

- Extension of the existing cooperation agreement Morocco-IN2P3 to include Grid activities. Meeting was held at CCIN2P3 (Lyon) on Friday 20 May 2005
  - Training at CCIN2P3 to unify technical and operational management, summer 2005
    - Grid Technology ( 1 person )
    - Software and applications ( 1 person)
  - To use IN2P3 Grid certificate
  - To fulfill LCG and ATLAS technical and practical requirements (ATLAS-GTTF)
- The agreement will be signed in September 2005
- Casablanca Conference : **Sharing knowledge across mediterranean area (5-6-7 September 2005)**
  - **Session on Digital Divide, Chair : G. Wormser**

