#### Expression of interest of LAL, Orsay to join the RD51 collaboration

## Laboratoire de l'Accélérateur Linéaire (LAL) (IN2P3/CNRS and Paris Sud University)



Located at the Paris Sud University campus between Orsay and Bures-sur-Yvette

Historical name: big linear e+e- accelerator was stopped in 2004.

Instead smaller new facility, PHotoInjector PHIL at LAL, for the R&D has been built.



- □ Biggest CNRS HEP laboratory in France:
- ~120 physicists
- ~220 engineers/technicians
  Annual budget (besides salaries):
- ~8 ME
- ☐ Hosting ~10 PhD thesis / year
- ☐ Surface of 18 000 m2, including 7 000 m2 of halls, workshops and clean rooms

Particle physics, cosmology and astroparticles, R&D instrumentation and accelerators LAL projets THE BANNES e n Planck LSST HFI **BAORadio** Réalisations Mécaniques Informatique Cosmologie R&D Détecteurs/ **XFEL** Astroparticules Technologie Instrumentation Coupleur VIRGO **AUGER** Electronique Pole THOMX CALVA Microélectronique JEM-EUSO **Physique** Advanced VIRGO PHIL Accelerateur SuperNEMO AppStat Mighty Laser SuperB NEMO PetaQCD ILC-CLIC ATF2 **ALFA** LHCb H1 SuperB **Physique** des BaBar **Particules** ILC ~30 projects ATLAS Groupe Théorie D0 SuperLHC

### **Gaseous detectors related activities**

Strong expertise on gaseous detectors (group ILC TPC by Vincent Lepeltier)
until 2007
Now re-establishing gaseous detectors activities at LAL via
☐ Joint activities on Micromegas/InGrid simulation and tests
with CEA/IRFU and Kiev University
☐ Development of the multi-purpose test facilities
☐ New flexible facility using low energy electrons from the photoinjector
PHIL at LAL proposed for the InGrid R&D
☐ Construction of the CORTO test facility: cosmic muon hodoscope with
precise muon track reconstruction
Involvement of SERDI: service of the R&D instrumentation and electronics
Involvement of the accelerator department for the construction of facility at PHIL

# Example: versatile facility at PHIL, spectrometer to sample "monochromatic" low energy electrons (positrons)

**Goal**: obtain samples of "monochromatic" electrons (positrons) with adjustable intensity and with adjustable energy between few 100 keV and 5 MeV and energy spread <10%

Test Bench
☐ Driving application: Micromegas/InGrid R&D
Physics measurements
☐ Non-relativistic electron (positron) energy losses with Micromegas/TIMEPIX
Students' hands-on
Principle:
Use electrons provided by PHIL
■ Momentum 5-8 MeV/c and up to 10 <sup>10</sup> particles per bunch.
☐ Timing: laser pulse with 7 ps FWHM
Reduce/smear energy/intensity using Al plug (W plug for lower intensity positron samples)
Select unique direction for electrons passing the plug with collimator set
Select required energy by half-turn of electron in the magnetic field (field value)
Adjust intensity/energy spread using another collimator set in front of tested detector
Simulation proved the principle

#### **Outline**

☐ The LAL group interested to join RD51

comprises physicists and detector and electronics engineers:

Oleg Bezshyyko

**Dominique Breton** 

**Leonid Burmistrov** 

Patrick Cornebise

Nicoleta Dinu

Oleksiy Fedorchuk

**Abdenour Lounis** 

Veronique Puill

Achille Stocchi

François Wicek

**Sergey Barsuk** 

- □ The group participates in joint developments with CEA/IRFU and Kiev University
- ☐ Field of interest in the framework of the RD51:

Micromegas/InGrid technology detector R&D and simulation