Minutes of the DESIR collaboration meeting at Paris, CNRS, January 10th 2006

J.-C. Thomas & M. Lewitowicz
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Participants: B. Blank, M.J.G. Borge, P. Campbell, F. Le Blanc, M. Lewitowicz, D. Lunney, G. Neyens, J.-C. Thomas

1) Low energy beam lines and equipment

1.1) High Resolution Separator and the Argonne Cf source project (**J.-C. Thomas**)

See the attached file "J.C. Thomas – DESIR Meeting 10-01-2006 HRS Designs.pdf" elaborated from the presentation T. Giles gave at the SPIRAL2 workshop on "Physics with low-energy beams at SPIRAL2" and from the following pdf documents:
http://www.phy.anl.gov/atlas/caribu/Cf252_upgrade_proposal_final_Rev4.pdf
http://www.phy.anl.gov/atlas/caribu/ATLAS_Cf_upgrade.pdf

- MoU between GANIL and Argonne to be reactivated after the end of the THALES study (Spring 2006), it would be interesting to include the HRS as a topic for this collaboration
- ISOLDE expertise and experience to be considered in the design of the HRS for SPIRAL 2
- MSU HRS project for RIA (DOI funded, Dave involved)
- HRS for SPIRAL 2 is one of the topics suggested by the FAIR-SPIRAL 2 technical working group for the future collaboration between two facilities: more details after the next meeting of this group in February/March

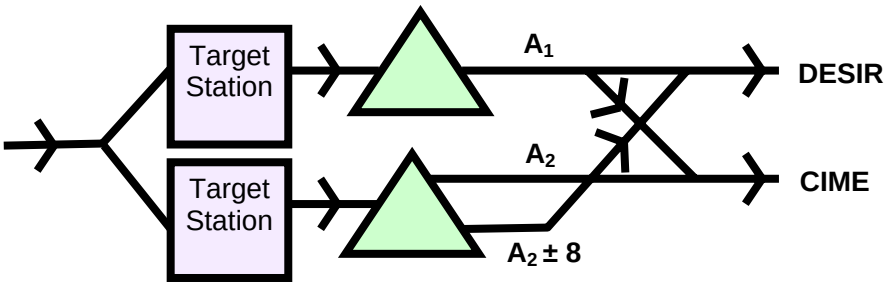
1.2) Current status of SPIRAL 2 & low energy beam line (**M. Lewitowicz**)

See attached file "M.Lewitowicz – DESIR Meeting 10-01-2006.pdf"
- Conclusion of the SP2 2004-2005 workshops: end of January 06
- Final Version of the White Book: January 06
- LoI: call probably in Feb. -> dead line in May 06
- Call for proposals: spring 07
- Conclusion of the SP2 mass separator review meeting:
    i. "The "Wien filter" approach seems better only because we lack information regarding the use of large beam intensity in electrostatic lenses and the detail of the beam transport between the Wien filter and the mass separator"
    ii. "One other option proposed by Remy Anne (Remark M.L.: the option proposed during the meeting), in this option the beam from the source is separated in space by a septum and then two beams are produced."
    iii. "On the other hand if this beam splitting appears not viable or one find this is not acceptable to reduce the intensity for the experiment and considering the cost associated with each proposed solution one can consider the addition of a second

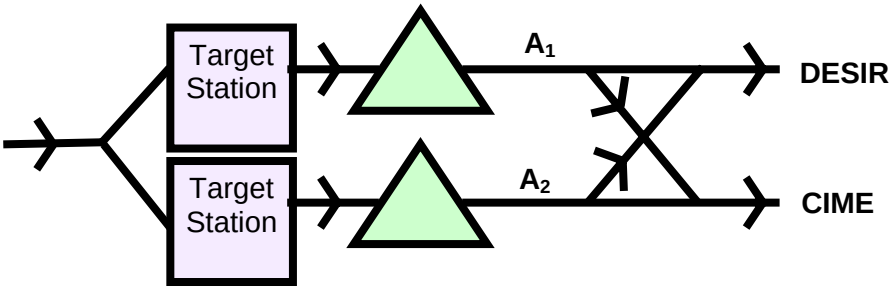
target station. The primary beam can easily be shared between the two stations using pulsed magnet."

- **Action** (J.-C. T. & M.L.): Clarify the possibility of a fast change of the mass setting of the first isobaric separation stage: can this be done independently from the setting of the high energy line?

- **Collaboration preferred solutions for the RIB separation and beam transport scheme for SPIRAL 2**: two separate target stations in order to keep a maximum flexibility in the use of different target-ion source combinations and to minimise beam setting time



First choice: option with one simple single-beam and second two-beam mass separators.



Second choice: option with two simple single-beam mass separators.

- **Question:** How frequent might be changes of isotopes (masses) during the SPIRAL 2 experiments with low energy beams?

i. Answer (based on the ISOLDE experiments):

Typically:

- Mass measurements: 2-3/shift
- Decay spectroscopy: 1/shift up to 1/3 days
- Laser spectroscopy: from 1/hour up to 1/shift

1.3) Current RFQ - collaborations and further actions (**D. Lunney**)

See attached file "D.Lunney – DESIR Meeting 10-01-2006 HRS Cooling.pdf"

- Problems of commonly used RFQ: intensity limited to 1 nA
- Next generation of cooler for μA beams: very small field gap (high pressure, kV confining field, 10 Mhz repetition rate)

- Post-Doc working with Dave (2 years contract) -> prototype of the device for SPIRAL 2 to be designed (40 kEuros asked for 2006 as an AP IN2P3 – no answer yet)
- **Action** (D.L.): "Cahier des charges" (specifications) for the RFQ cooler should be available – end of 2006
- Expertise on RF needed from, for example, GANIL or IPN Orsay from 2007. More detailed request once the specifications are available
- RFQ development has a strong synergy with EURISOL and FAIR-NUSTAR
- Collaboration of CSNSM with MSU on the same topic (cooling of high intensity ISOL beams)

1.4) Equipment for laser spectroscopy at ALTO and SPIRAL2 (**F. Le Blanc**)

See attached file "F. Le Blanc – DESIR Meeting 10-01-2006.pdf"
- ALTO beam-lines: 4 = β-spectroscopy + "fridge" + laser spectroscopy + TAS
- The collinear laser spectroscopy line + room for ALTO: project funded (ANR + IN2P3)
- 1 high power YAG 20 kHz laser which might be used for the SPIRAL 2 laser source is available at CEA-DEN (for about 63k€)
- Laser ionisation of Cu at ALTO (mid 2007)
- Laser spectroscopy experiments at ALTO should start end of 2007
- Price of the laser spectroscopy line: ~ 300 kEuros – approximate cost of the setup for SPIRAL 2

LUMIERE within DESIR:
- Laser Utilisation for Measurement and Ionisation of Exotic Radioactive Elements set-up: Collinear Laser Spectroscopy = new line? + MOT (Willmann) + Laser+RF Paul Trap (Christophe Theisen)
- Collaboration with LPC might be established on this topic

2) Collaboration issues

2.1) **Decision:** The DESIR (**D**écroissance **E**xcitation et **S**tockage d'**I**ons **R**adioactifs) collaboration dedicated to physics with low energy beams at SPIRAL 2 was initiated during the meeting.
2.2) Letter(s) of intent for DESIR:
- no rules with respect to the format are defined at the moment, the content should define the collaborations, range of beams requested, general words on equipment
- It is proposed to prepare in the **next four weeks** (before February 10th) a draft of one general letter of intent containing different chapters (name of responsible for a given chapter in brackets):
  i. Introduction and technical issues (B. B. and G. N.)
  ii. Decay spectroscopy (M.J.G. B.),
  iii. Laser Spectroscopy (F. L.),
  iv. Trapping and storage (D. L.)

2.2) Request for funding (ANR, EU etc.)

See in attachment the presentation by J.C. Thomas “J.C. Thomas DESIr Meeting 10-02-2006 Demande ANR.pdf”

Actions (J.-C. Thomas & D. Verney):

- precise determination of the cost
- look for other people possibly interested to join the project
- check whether radioactivity issues are of concerned for the SPIRAL2 identification stations
- contact Philippe Dessagne (IReS Strasbourg) to check the relevance of the R&D program for the building of a fast tape transport system

2.3) Internal organisation of the DESIR Collaboration

- **Decision:** B. Blank – spokesman of the DESIR collaboration, GANIL correspondent: J.-C. Thomas
- **Actions**:
  i. enlarge the collaboration to all interested labs and participants as soon as possible,
  ii. find names for the different sections (LUMIERE + ?).

3) Other considerations:

- **Strong request** of the collaboration that the building for DESIR experiments is financed and constructed within the SPIRAL2 project.
- The design study and the construction of the laser ion-source should be attributed (ALTO?)
- Expected nominal beam time available at SPIRAL2: in total 112 weak/year for physics (48 from SPIRAL2), 7 weeks/year R&D, 44 w/y of the LINAC operation, 20 w/y for the experiments with low energy RIB
- Who will take care of the Off-Line Source and the cooler-buncher device? CENBG (B. Blank) might be responsible for a study and construction of another target-ion source for the production of neutron-deficient beams in fusion-evaporation and possibly other reactions

4) **Date and place of the next meeting: 14th of March 2006 in Paris.**