

**Report on**

**ADS-related ISTC Project Collaborations at FZK**

**(Projects #2048, #2405, #2524, #2573 and #2578)**

**Activities Chairman SAD/YALINA Steering Committee**

***C.H.M. Broeders, FZK/IRS-NR***

Current status of FZK ISTC collaborations (1)

Cross section measurements:

- St. Petersburg Russia
  - #540, #1309, #2213, #2257 Neutron induced fission cross sections 20-160MeV  
Project manager (PM) Prof. Eismont, continuation on schedule
  - #964, #2524 Model development heavy nuclei fission cross sections in wide energy range, PM Dr. Yavshits, no significant feedback (see below).  
New proposal for collaboration, see below.
- Moscow Russia
  - #839, #2002 residual spallation products, PM Dr. Titarenko.  
Extension of #2002 for TRADE project was proposed, but failed due to problems with TRADE Project (stopped). Now continuation in new project #3266 is proposed, discussion at this meeting.

Current status of FZK ISTC collaborations (2)

Integral physics measurements:

▪ Obninsk/Dubna Russia

- #1372 Radiochemical and activation analysis of long life nuclear waste, joint project of IPPE Obninsk and JINR Dubna, PM Dr. Smetanin. **Status of this project not fully clear, but several problems happened during execution**
- #2267 SAD, creation of proton driven sub-critical system, PM Dr. Shvetsov. **SAD was main subject of support in past two years. More details in report on SAD/YALINA Steering Committee**
- Minsk Sosny Belarus #B070 YALINA, sub-critical thermal system with powerful neutron source. PM Dr. Kievitskaya. **YALINA has now broad international support. More details in report on SAD/YALINA Steering Committee**
  - **New proposal** by S. Yavshits, KRI St. Petersburg for “*Experimental Investigations of Electron-Accelerator-Driven Transmutation Technologies (E-ADTT)*”, (12/2005), copies of proposals available.

**Current status of FZK ISTC collaborations (3)**

**Technological projects:**

- **Snezhinsk, Ekaterinburg, Moscow:**
  - **#1606 Molten Salt Loop for Waste and Plutonium Disposal,**  
PM Dr. Grebyonkin, **no relevant actions after visit to Snezhinsk 01/2004**
- **St. Petersburg**
  - **#2048 Improvement of Corrosion Resistance of Constructional Steels,**  
PM Dr. Engelko. **Decisions required for prolongation of the project!**  
See comments of G. Müller
- **St. Petersburg**

#2573 Laser Separation of Lead Isotopes, PM Dr. Yudin, **decisions pending for approval of second stage of project.** Common meeting in summer 2005, First stage was finished satisfactorily with two new collaborator commitments: SCK-CEN and PSI.

More details may be provided at CEG meeting on request

***Project title:*** Development of nuclear data library for nucleon-induced reactions on heavy nuclei in wide energy region

***Project manager:*** Sergey G. Yavshits

***Leading institution:*** V.G.Khlopin Radium Institute St. Petersburg

***Collaborators:*** Texas A&M University, IAEA, Kyungpook National University, FZK

***Duration:*** 36 months, costs USD204000

***Funding:*** USA

***Remark:*** FZK was involved by ISTC in the end formulation of the proposal. Links with 6. ECFP IP EUROTRANS WP5 NUDATRA are encouraged. **No feedback up till now. Probably only collaborators from funding parties are informed about progress**

***Project title:*** Transmutation of radioactive nuclear waste – present status and requirement for the problem – oriented nuclear data base. Approach to scheduling experiments (reactor, target, blanket)

***Project manager:*** Yuri A. Korovin

***Leading institution:*** INPE, Obninsk

***Collaborators:*** KTH, FZK, IAEA

***Duration:*** 12 months, costs USD80000

***Funding:*** EC

***Remark:*** The proposal was presented at ISTC meeting in Moscow. Recommendations of collaborators were included in final version of proposal at Moscow meeting.

**[Final presentation at this CEG meeting.](#)**

**ISTC Project #2573**

***Project title:*** Investigation of processes of high – performance laser separation of lead isotopes by selective photoreactions for development of environmentally clean perspective power reactor facilities

***Project manager:*** Yudin A. Mihailovich

***Leading institution:*** NIEFA, St. Petersburg,

***Collaborators:*** FZK

***Duration:*** 24 months, costs USD800000

***Funding:*** EC, upper limit Euro175239, \$USD11000 authorized for first phase author will demonstrate support and interest of EU community.

**Decisions pending for approval of second stage of project. Common meeting June 2005. First stage was finished satisfactorily with two new collaborator commitments: SCK-CEN and PSI. More details may be provided at CEG meeting on request**



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**Activities of SAD/YALINA Steering Committee**

- The SAD/YALINA SC was established at our last CEG meeting, to support **integral ADS and Transmutation related ISTC projects**
- Five SC Meetings were organized (**electronic and paper copies of all minutes are available at this CEG meeting**):
  - SY-SCM 1, JINR Dubna, July 13, 2004
  - SY-SCM 2, JIPNR Minsk, January 24-25, 2005
  - SY-SCM 3, JINR Dubna, June 27-28, 2005
  - SY-SCM 4, JINR Dubna, September 15-16, 005
  - SY-SCM 5, JIPNR Minsk, December 5-6, 2005

**Highlights SY-SCM 1 Dubna, July 13, 2005**

- **Proposed Charter for SAD/YALINA Steering Committee was accepted**
- **Status and progress of main projects SAD and YALINA were presented and discussed in detail**
- **Foreign collaborators stressed assessment of “Dynamics Experiments” in SAD**
- **SC recommended creation of SAD brochure and short leaflet**
- **Synergies/collaborations with other ISTC projects for creation of SAD were discussed: ISTC Project #1372, SAD startup support by (new ISTC experiment?) at BFS/Obninsk**
- **Role of high energy neutrons in SAD was stressed**
- **Main issues of the meeting were time schedules and reliable cost estimates**
- **Action plan was agreed for following areas: SAD design, radiation shielding and general issues**

**Highlights SY-SCM 2 JIPNR Minsk, January 24-25, 2005**

- **New funding perspectives for SAD in EC FP6 IP EUROTRANS in connection with withdrawal of TRADE contribution**
- **First detailed cost and time schedule estimates for SAD; 432 Mroubles ( $\approx 12$  MEuro), reachable ambitious goal to have first physics experiments in SAD in 2008**
- **Presentation of YALINA booster experiments with mixed neutron spectra**
- **Discussion of power increase options in SAD**
- **Proposal for target irradiation benchmark based on SAD preparation experiments**

Highlights SY-SCM 3 JINR Dubna, June 27-28, 2005

- Dubna Director Designate A. Sissakian underlined the important role of SADS in the JINR Dubna roadmap.
- Funding problems for SAD were recognized; cost optimization by “ISTC channeling” was proposed: 6 MEuro realistic?
- Discussion of consequences of PHASOTRON fire in April 2005
- Proposal for funding scheme “one third each”: JINR Dubna, ISTC, IP EUROTRANS
- Round table discussion with Management of JINR Dubna and ISTC Executive Director N. Jousten => SAD realization is an ambitious project, realizable without recognizable technical killing issues, but with challenges for the funding
- YALINA is well integrated in international projects (DOE, EC IP EUROTRANS). Next experiments series will be done with “booster” mixed spectrum configuration

**Highlights SY-SCM 4 JINR Dubna, September 15-16, 2005**

- **Main objective: clarification of funding modalities in framework of “one third each” scheme.**
  - **IP EUROTRANS has made commitments for this solution.**
  - **Corresponding ISTC support channels are in discussion with good perspectives.**
  - **Formal commitments of JINR Dubna are required to enable progress with EUROTRANS cooperation.**
- **YALINA is proceeding as scheduled. Creation of International Science Laboratory (ISL) with YALINA is discussed and recommended.**
- **PHASOTRON could be visited after April fire**
- **Statement of JINR on scientific working program of SAD with IP EUROTRANS Domain 2 ECATS was signed by four key representatives of JINR**

**Highlights SY-SCM 5 JPINR Minsk, December 5-6, 2005**

- **The SY-SCM5 was held in conjunction with IAEA RCM for CRP on ADS Benchmarks**
- **IP EUROTRANS DM2 ECATS was presented by designated coordinator G. Granget**
- **With support of SY-SC members the SAD project was approved by the Program Advisory Committee (PAC) of JINR Dubna. However, additional external funding support is recommended.**
- **Technical progress of SAD is on schedule.**
- **Organizational aspects for formal prolongation of ISTC projects SAD and YALINA**
- **Letters of recommendation for SAD and YALINA were prepared by collaborators**
- **Draft proposal for creation of International Center of Excellence for Transmutation (ICE-TR) in Minsk was prepared.**