Target work at BINP

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BINP Visit

- I visited Pavel Logatchev (very briefly unfortunately) at BINP in August 2007
- I want to explain their work plans as I understand them

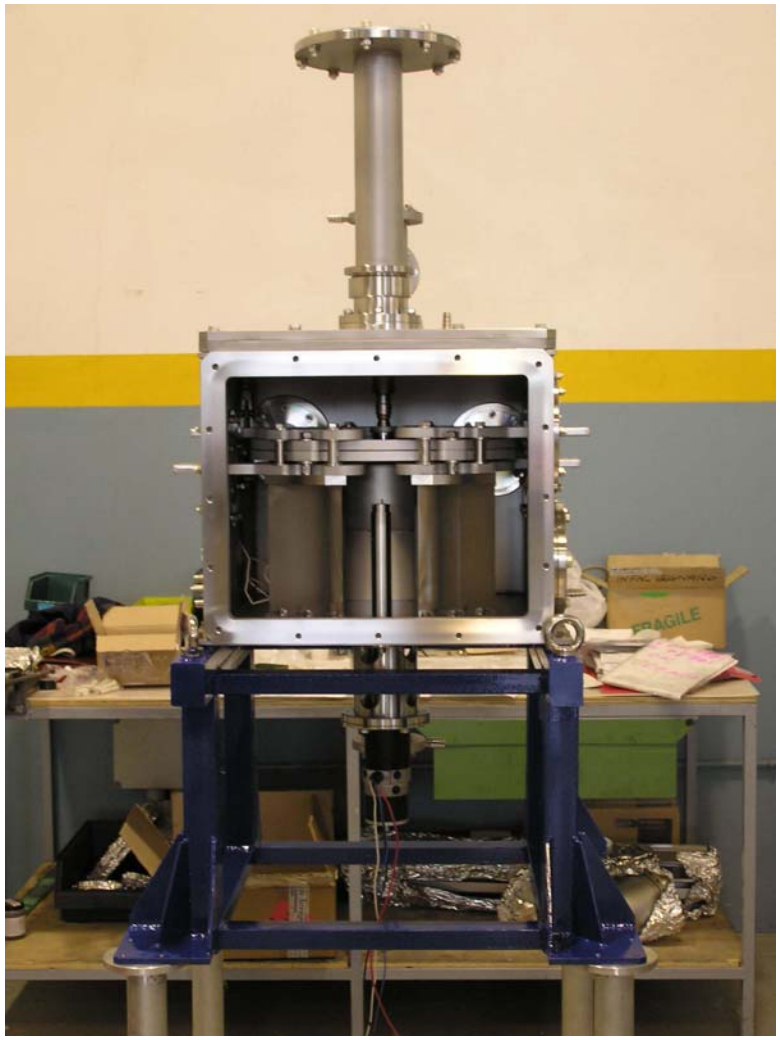
ISTC Projects

- The International Science and Technology Center (ISTC) was established by international agreement in November 1992 as a nonproliferation program.
- BINP have recently completed Project ISTC #2257 on "Proton Accelerator Based Intense Source of Radioactive Ions for Nuclear Physics Experiments"
- BINP have just started a new, 2 year, funded ($750k) project that follows on from this - "Development of high power solid state neutron production targets for SPIRAL-II (GANIL, France) and SPES (LNL-INFN, Italy) facilities."

First Project Outcome

- Particular design of high temperature rotating target
- Yield and spectrum-angle distribution of neutrons generated in the target with a converter made of natural carbon and ^{13}C isotope material
- Conceptual design of biological shielding of the target assembly
- Numerical simulation of thermal and mechanical modes of the neutron
- The neutron target prototype was manufactured and successfully tested under the powerful electron beam.
- The remote handling approach for the target area elements was analyzed on the base of existing practical experience

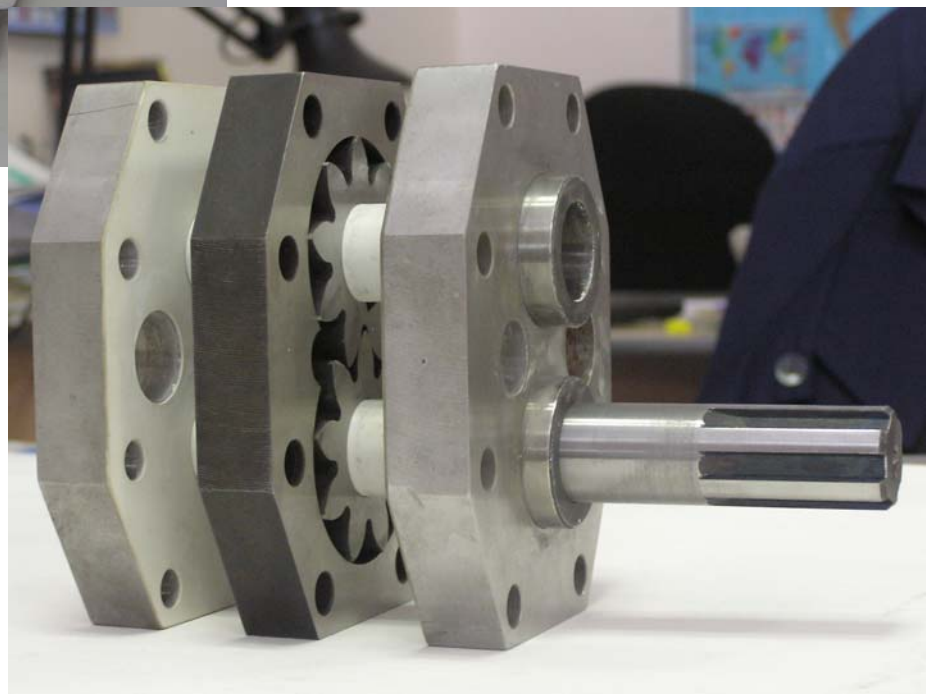
Prototype



- Main goals of this stage were the assembling of the prototype, obtaining the vacuum conditions, reaching the nominal rotation speed (up to 50 Hz). Figure shows the prototype ready for these tests.

New Project

- Its base is the original design of the rotating neutron production target with the converter made of graphite and cooled by thermal radiation.
- The basis of the development of target suspension clip and driving gear should be the liquid metal (LM) pumping circuit which was produced at BINP for LM targets and successfully operated for around 10000 hours.
- Designing and prototyping the liquid metal cooling systems and target driving gear, including the liquid metal hot pump, leading-in circuit, rotation motor, target assemblies.



Liquid lead/tin system to operate at 300 – 400 C
Regular ball bearings failed in previous tests at high temperature
Suitable for ILC drive also

New liquid metal pump

In House Program

- They will continue with their liquid target program
- Hope to have prototype next year, incorporating boron-nitride windows
- Planning beam tests

ILC

- All of this work appears to be compatible with ILC
- Challenge will be to include BINP within the team adequately