CREMLIN PLUS
Connecting Russian and European Measures for Large-scale Research Infrastructures

BUDKER INSTITUTE OF NUCLEAR PHYSICS (BUDKER INP) – COMPLEX OF LONG OPEN TRAPS (CLOT)

BUDKER INSTITUTE OF NUCLEAR PHYSICS is the largest Russian academic institute, one of the world's leading research centers in the field of particle physics, accelerator physics and technology, synchrotron radiation sources, free-electron lasers, high-temperature plasma physics, and controlled fusion. Some ideas that determine the state-of-the-art accelerator science and technology were proposed and implemented at the Budker INP.

The institute has developed and verified the original concept of the fusion plasma confinement in linear traps based on a unique research infrastructure that is a complex of the long open traps **CLOT. CLOT** includes several specialized facilities creating a knowledge base required for the future fusion reactor based on the open traps. The research is aimed at the creation of fusion reactors and high-performance neutron generators for different applications: testing of materials for future reactors, post-combustion of radioactive waste and control of subcritical fission reactors. The results obtained are applied to materials science, energy, environment etc.

The installations of the **CLOT** can be used jointly or according to independent research programs. Currently, the Budker INP plasma laboratories are focused on the next generation of the linear traps – GDMT (the Gas-dynamic multiple mirror trap). **GDMT** includes all recent advances in physics of the mirror plasma and is intended for the development of the technologies for plasma confinement.

CONTACTS:

Address: 11, Academician Lavrentyev Avenue, Novosibirsk, 630090 Russia

Website: http://press.inp.nsk.su/nauka/issledovatelskaya-infrastruktura/nauchnye-ustanovki/kompleks-dol

Instruments:	Domain and object of research: PSE; ENE; ENV
Name of the instrument or the technique used	**Brief description of the Instrument or of the technique used**
GDT: Gas-dynamic trap	The **GDT main achievements** are the confinement of the stable high energy density plasma; overcoming micro-instabilities and suppression of the electron thermal conductivity. These 3 accomplishments provide a basis to reconsider the mirror concept as a neutron source and fusion reactor. GDT is equipped with a powerful NBI and ECR heating and broad range of diagnostics.
GOL-NB: Multiple mirror trap	The **GOL-NB** facility is aimed on the improved confinement in linear machines. The axial plasma losses from the gas-dynamic central cell are suppressed by the sections with the corrugated magnetic field. This facility has flexible magnetic configuration and is equipped with the appropriate automation and measuring systems.
CAT: Compact axisymmetric toroid experiment	The **CAT** device is intended to study plasma equilibrium with the maximum attainable value of relative plasma pressure. The power of the NBI heating is presumably enough to reach the plasma pressure equal to the guide magnetic field one.
SMOLA: Helical mirror	The **SMOLA** device is aimed on the control of the axial plasma flow by the multiple mirrors moving in the plasma's frame of reference.
BETA: plasma-surface interaction	The **BETA** device is modelling the heat loads on the plasma facing components. The main instrument is the electron beam with the power density equivalent to the ELMs in tokamaks.
GOL-PET: beam-plasma interaction	The **GOL-PET** device studies the generation of the THz range electromagnetic radiation produced by the electron beam in plasma.