Proposal for participation of ITEP team in the new R&D project aimed to develop radiation hard solid state detectors for future experiments.

1. **Name of the Institute**:

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2. **Group members (time devoted to this activity):**

B.Bekenov(10%)
V.Golovin (20%)
E.Grigoriev (10%)
M.Kozodaev (10%)
E.Prokop'ev (5%)
A.Zaluzhnyi (5%)
V.Grafutin (5%)
A.Suvorov(5%)

3. **Current activities of the group:**

- Studies of radiation-induced defects in silicon and other materials by means of Scanning Tunnelling Microscopy, Atomic Force Microscopy and atom-probe field ion microscopy;
- Development of silicon detectors with intrinsic gain (avalanche amplification);
- Studies of radiation hardness of avalanche silicon detectors;
- Development of fast electronics for characterization of silicon detectors.

4. **Fields of interest within this collaboration:**

- Microscopic studies of effects induced by high-fluence irradiation of silicon and other detector media and subsequent changes due to beneficial and reverse annealing;
- Development of radiation hard silicon detectors with intrinsic gain;
- Studies of charge collection dynamics in avalanche silicon detectors before and after irradiation.

5. **Available resources:**

- Scanning Tunnelling Microscope;
- Atomic Force Microscope;
- Atom-probe Field Ion Microscope;

- Facilities for design and production in small quantities of test avalanche structures and test structures in standard planar technology;
- Resources for design and production of fast current and charge amplifiers for detector studies;
- Facilities for design and production of printed circuit boards.

ADDENDUM: a list of some relevant publications

STM analyses of surface phenomena in Si(1 0 0) under proton irradiation, *Ultramicroscopy, Volume 82, Issues 1-4, February 2000, Pages 111-117*
M. A. Kozodaev, O. N. Makeev and A. L. Suvorov
SummaryPlus | Article | Journal Format-PDF (1333 K)

New results on MRS APDs, *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Volume 387, Issues 1-2, 1 March 1997, Pages 231-234*
A. V. Akindinov, A. N. Martemianov, P. A. Polozov, V. M. Golovin and E. A. Grigoriev

Field ion microscopy study of the interactions between self interstitials and impurities in metals, *Applied Surface Science, Volumes 94-95, March 1996, Pages 384-390*
A. L. Suvorov and D. E. Dolin
Abstract | Journal Format-PDF (649 K)

Quantitative scanning tunneling microscopy of radiation-induced modification of materials surface, *Materials Science and Engineering A, Volume 270, Issue 1, 15 September 1999, Pages 102-106*
Yu. N. Cheblukov, A. S. Fedotov, M. A. Kozodaev, B. A. Loginov, M. O. Popov, A. E. Stepanov and A. L. Suvorov
SummaryPlus | Article | Journal Format-PDF (706 K)