Curriculum vitae

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Scientific degree: **Professor** of "Physics of charged particle beams and accelerator physics" (2008), **Doctor of sciences** (1998, Dubna, JINR), **PhD** (1980, Moscow, INR), **master degree** (1975, Moscow Physical Engineering University).

Career:

1969-1974	student of Moscow Engineering Physical University, faculty of accelerator
1975-1980	Scientist of Institute for Nuclear Research of Russian Academy of Sciences (INR)
1980-1985	Senior scientist of INR
1985-1987	Head of Beam Dynamics Laboratory of INR
1987-1992	Head of Kaon Factory Project and Head of KF Laboratory of INR
1993-1995	Head of KF Laboratory in INR and scientist-collaborator of SSC Laboratory, USA
1995-1996	Guest-professor in KEK, Japan and leading researcher in INR 1992-1993
1996-2000	Accelerator physicist, head of synchrotron Light Source ASTRID II project Institute for Storage Ring Facilities, Aarhus University, Denmark
2000-2018	professor, senior researcher, staff position A1 in Forschugscentrum Juelich, Germany

I have more than 40 years experience in the particle beam physics with the significant contributions to the design, analysis and operation of accelerators. I am an expert in beam dynamics and electrodynamics in accelerator. I have prepared 10 PhD students which successfully defended PhD thesis and 8 of them are from Russia.

Activity:

1. **Moscow Meson Factory 1975-1982 (head of beam dynamics laboratory):** the high intensity linear accelerator has been done and works
2. **Moscow Kaon Factory 1985-1992 (project leader)** has been done design and not realized, but later the lattice has been used in TRIUMF Factory project, SSC LEB, Neutrino Factory in CERN, PS2 in CERN, JPARC Main Ring in Japan
3. **TRIUMF Kaon factory 1987-1992 (collaborator)** has been design and not realized due to Canada government decision
4. **SSC Linac 1992-1993 (guest senior scientist)** has been done and works
5. **JPARC Main Ring (1995-1996): Senichev's free transition energy lattice** has been designed and realized
6. **ESS project 1996-2005** (scientist collaborator from Denmark and later from FZJ) has been designed and at present is under realization in Sweden
7. **Astrid 1 (synchrotron light source) modernization 1995-2000 (senior scientist):** new RF station tuner and double life time of electron beam has been done
8. **Astrid 2 project** Denmark (synchrotron Light Source, leader project) 1997-2000 has been designed and realized
9. **Neutrino factory project in CERN 1999-2001** has been done designed and not realized
10. **PS2 project in CERN** has been designed with my participation and later it was postponed
11. **COSY linear accelerator design in FZJ** has been done and not realized
12. **HESR lattice in FZJ** has been designed under my direct participation and at present it is under construction.
13. **JEDI collaboration in FZJ :** new dEDM ring under design

I have about 170 published papers.

The most interesting results:

In the normal conducting linear accelerators:

- the theory of the irradiated electromagnetic field by beam in multi-gap cavity of linear accelerator;
- the special procedure for tuning of the RF amplitude and phase, using the induced electromagnetic field by beam;
- the beam dynamics investigation in the linear accelerator consisting of tanks with constant phase velocity;
- the Delta-T procedure for real cavity with errors ;
- the electrodynamics of the interaction beam with the cavity during the transient in the multi-modes consideration;

- the novel RF deflector based on the H cavity;

In the super-conducting linear accelerators:

- the slot-finger structure for the superconducting linear accelerator
- the theory for super-conducting linear accelerator based on the separatrix formalism;
- the new super-conducting slot-finger structure.

In the circular light ions accelerators:

- the Moscow Kaon Factory project;
- the original lattice with simultaneous modulated gradient and curvature and sufficiently large dynamic aperture after chromaticity correction. This lattice has been used in TRIUMF booster, SSC LEB, CERN Neutrino Factory, in constructed at present Japan Hadron Factory and in HESR (FAIR);
- the theory of "resonant" lattice for a synchrotron with a low or negative momentum compaction factor;
- the space charge effect in intensive accelerator;
- the varactor for the fast frequency tuning in RF cavity;
- HESR structure;

In the synchrotron light sources:

- the new lattice for the synchrotron light source “ASTRID II” with the lowest emittance of the electron beam;
- the RF phase modulation increasing the beam life time in the synchrotron light sources. This idea has been checked experimentally and adopted in synchrotron "Astrid I". It is used in KEK photon factory as well;
- the new tuner without the spring contactor shielding for RF station in Astrid1;

In electrostatic rings:

- the beam dynamic theory for the electrostatic circular accelerators applied to ELISA in Aarhus University;
- The frozen and quasi-frozen spin lattice for EDM search.

Yu.Senichev , March 2017

*Publications of **Yu. Senichev** for last 17 years*

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