



Outline

- Short history
- The project's fundamentals
- Machine parameters
- Time schedule and current activities
- International cooperation
- Summary



History of efforts

- ~ **1998** first idea emerged
- **1998-2006** several failed tries:
 - transfer BESSY or SuperACO, Aurora-2, low-energy ring based on Metrology Light Source
- **2006-2008** fight for a 3 GeV ring Canadian Light Source
 - September 2006 application for establishing The National Synchrotron Radiation Centre
 - February 2007 the Centre listed an 'indicative' project
 - September 2008: only 40 M€ allocated
- End of 2008 preliminary contract adjusted to budget -signed
- **2009** series of international brain storms: *the best synchrotron light source for 25 M*€
 - 1.5 GeV ring project based on the MAX-Lab technology
- October 2009 adjusted feasibility study submitted
- **February 2010** evaluation process successfully completed and the project approved



Three important dates

• 30 October 2009

Memorandum of Understanding between MAX-lab and Jagiellonian University







Three important dates

• 9 April 2010

The Minister of Science and Higher Education and The Jagiellonian University Rector signed the contract for National Electromagnetic Radiation Research Centre at the Jagiellonian University







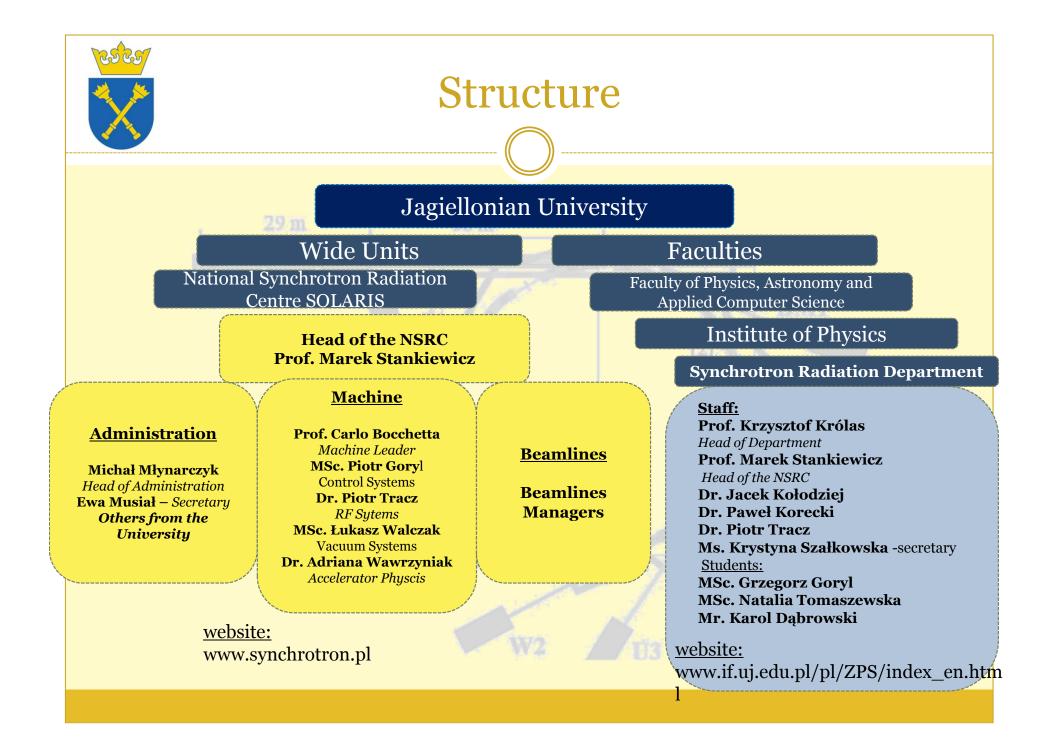
Three important dates

• 24 March 2011

Building company was selected and contract was signed







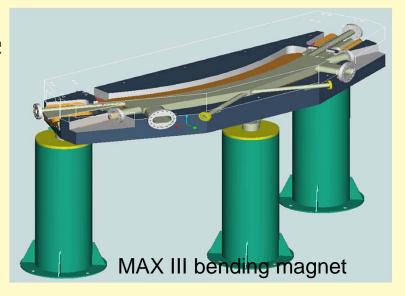


The project's fundamentals

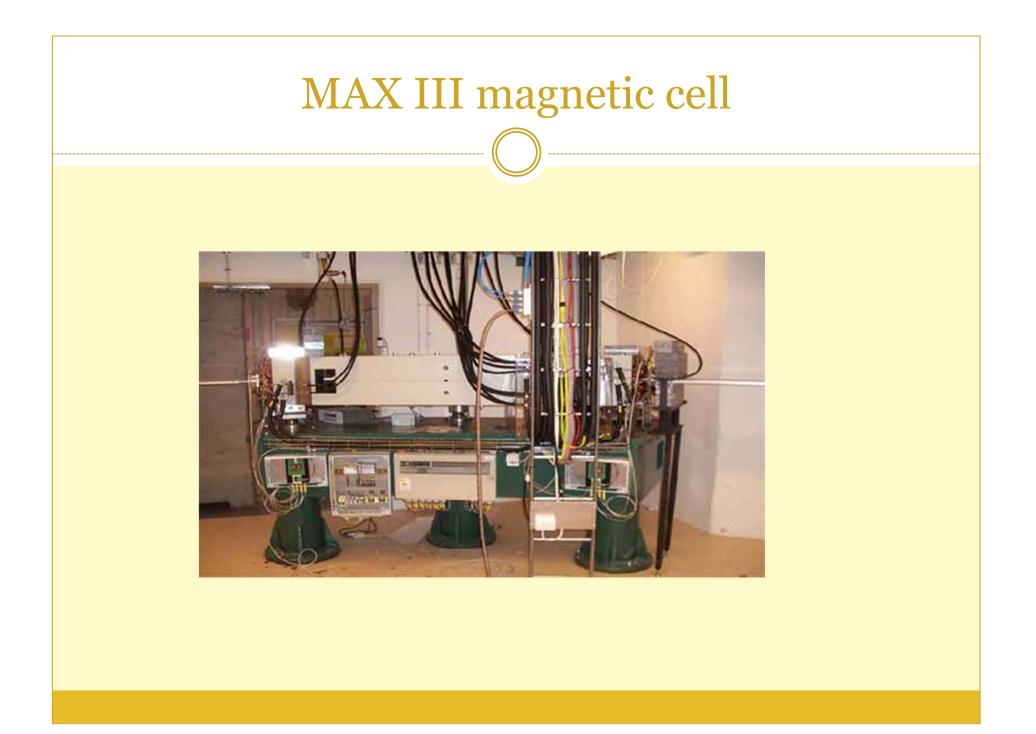
- Building 15 M€
- Machine (injector, storage ring, beamline) 25M€
- Close coopertion with MAX-Lab:
 - MAXIV facility
 - > 3 GeV storage ring
 - > 1.5 GeV storage ring in two copies
 - > SPF short pulse facility

Integrated magnets technology

- 1 block for the entire DBA in the 1.5 GeV ring
- ✓ Compact lattice
- Combined- function magnets for compact optics
 - Gradient dipoles in both rings
 - Quads with integr. sextupole in 1.5 GeV ring
- Solid-iron magnet block magnets
 - excellent alignment
- Massive concrete supports with mounting plate
 excellent stability
- NEG coated vacuum chambers
- reduction of ion pumps and lumped absorbers
- 100 MHz RF system + 300MHz Landau Cavities



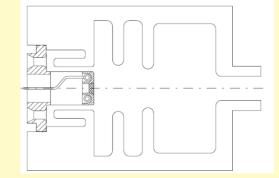
- M. Eriksson, M.Bergqvist, L.-J. Lindgren, M. Brandin, M. Sjöström, S. Thorin, *Proceedings of EPAC* 2006, Edinburgh, Scotland
- G. LeBlanc, Å. Andersson, M. Demirkan, M. Eriksson, L-J. Lindgren, H. Tarawneh, S. Werin, B. Anderberg, *Proceedings of the 2003 Particle Accelerator Conference*

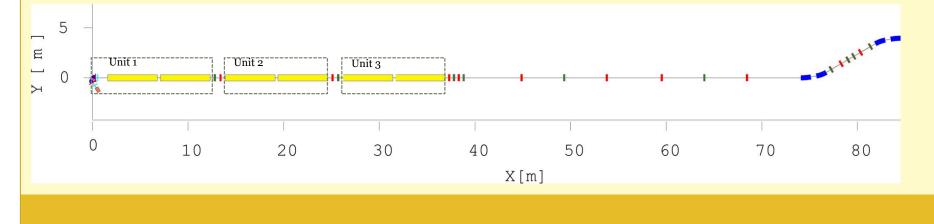


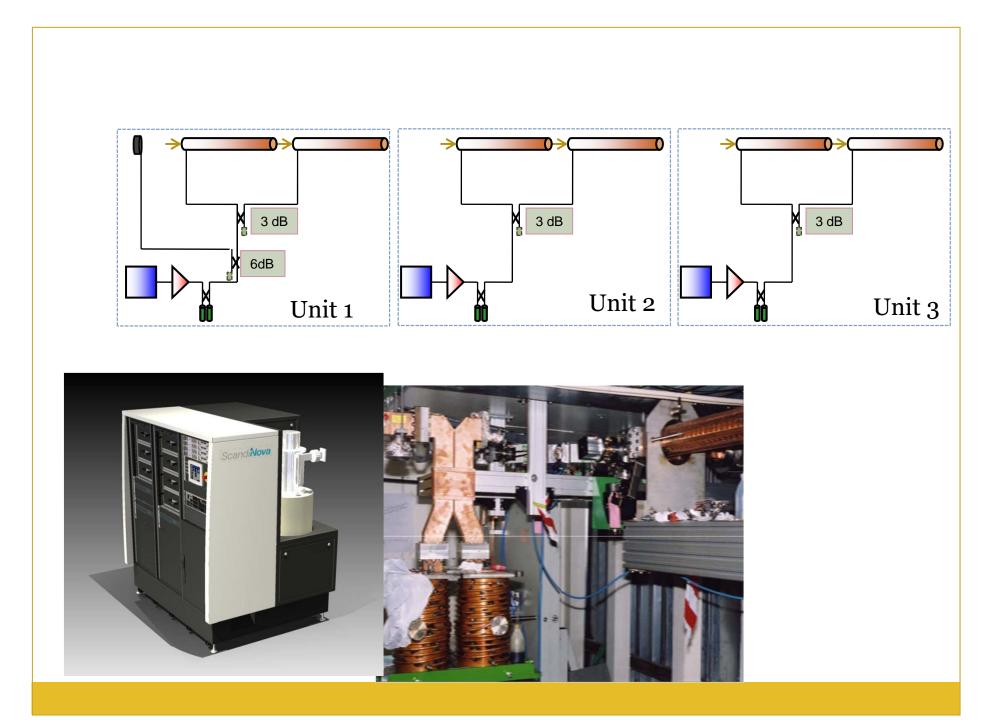


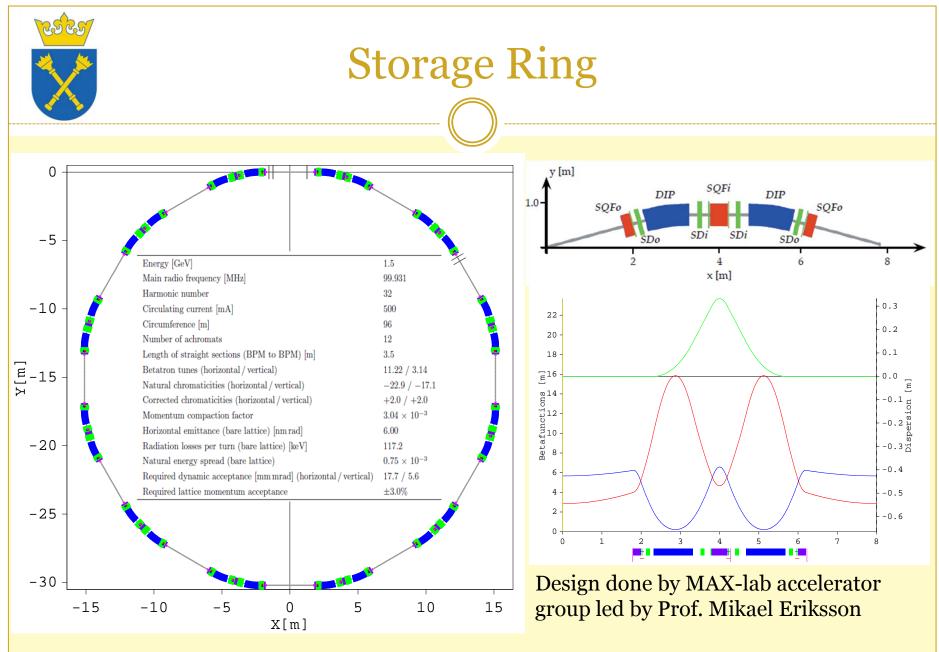
Injector

- Thermionic 3 GHz RF gun BaO cathode
- ✓ Normalized emittance -11 π mm mrad
- ✓ Energy −up to 2.3 MeV
- 6 accelerating structures combained in 3 units
- ✓ Accelerating gradient 20 MeV/m
- ✓ S-band 2998.5 MHz
- Power: 3 RF Units :
- ✓ ScandiNova K₂ modulators
- ✓ Toshiba klystrons
- ✓ SLED cavities

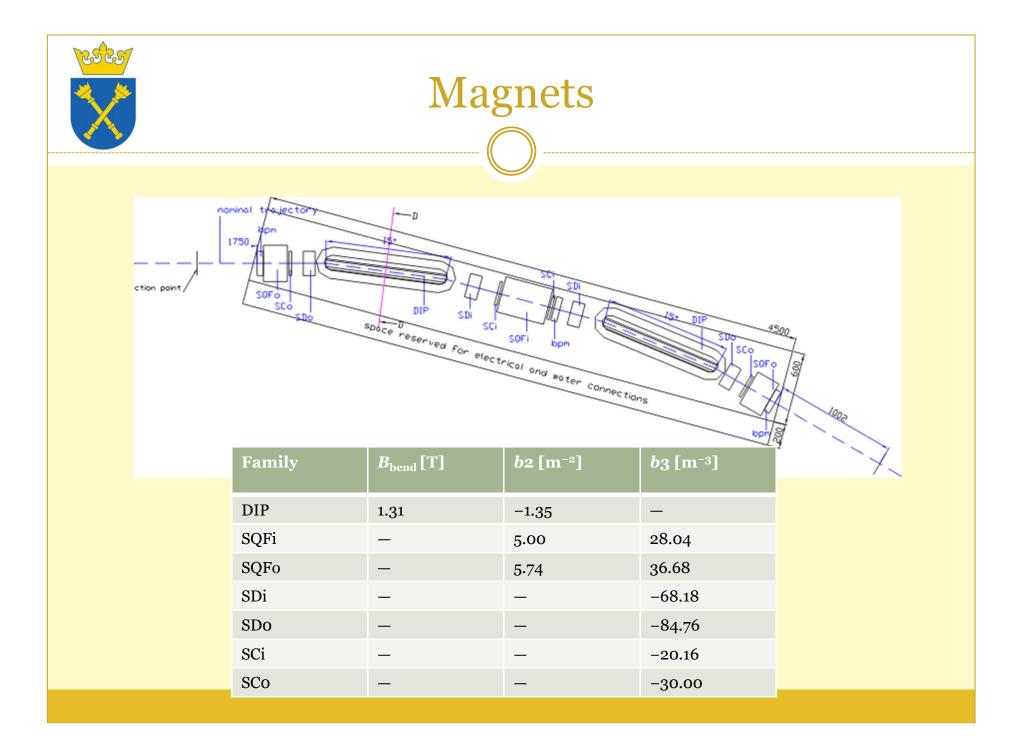


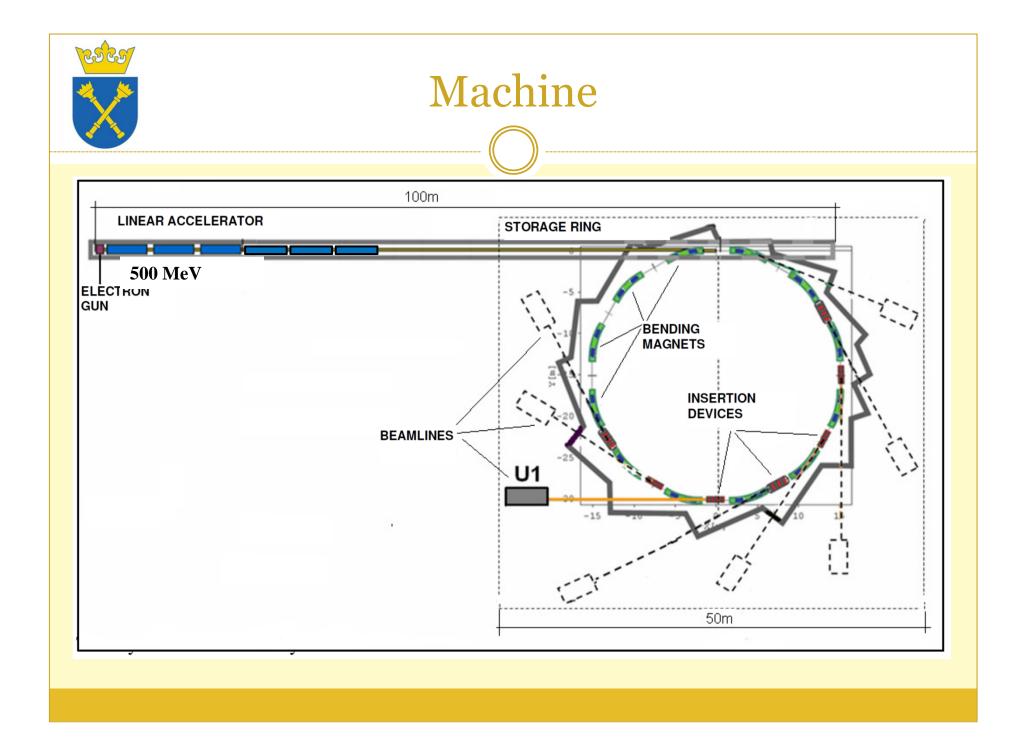






"Detailed Design Report on the MAX IV Facility", http://www.maxlab.lu.se/maxlab/max4/DDR_public/index.html, § 3,







General Schedule

Timetable 2009 2010 2011 2012 2013 2014 Feasibility study Task I: Building Task I: Building IIIIIIIV IIIIIIV IIIIIIV IIIIIIV IIIIIIV IIIIIIV IIIIIIV IIIIIIV IIIIIIIV IIIIIIV IIIIIV IIIIIV IIIIIV IIIIIV IIIIIV IIIIIV IIIIIV IIIIIV IIIIV IIIIIV IIIIIIV IIIIV IIIIIV IIIIV IIIIV IIIIV IIIIV IIIIIIV IIIIV IIIIIIV IIIIV IIIIIIIIV IIIIIIIIV II																									
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Current Activities

- Ongoing training 2 people at MAX-lab, 1 at PSI, 1 at ALBA
- Ongoing work on building design
- Machine design at MAX-lab
- Logo competition
- Purchasing procedures started:
 - RF Units (ScandiNova)
 - > Accelerating Units (Research Instruments)
 - > Steel for magnets manufacturing (AK Steel Ltd.)
 - RF Cavities (Research Instruments)
 - > Waveguides tender



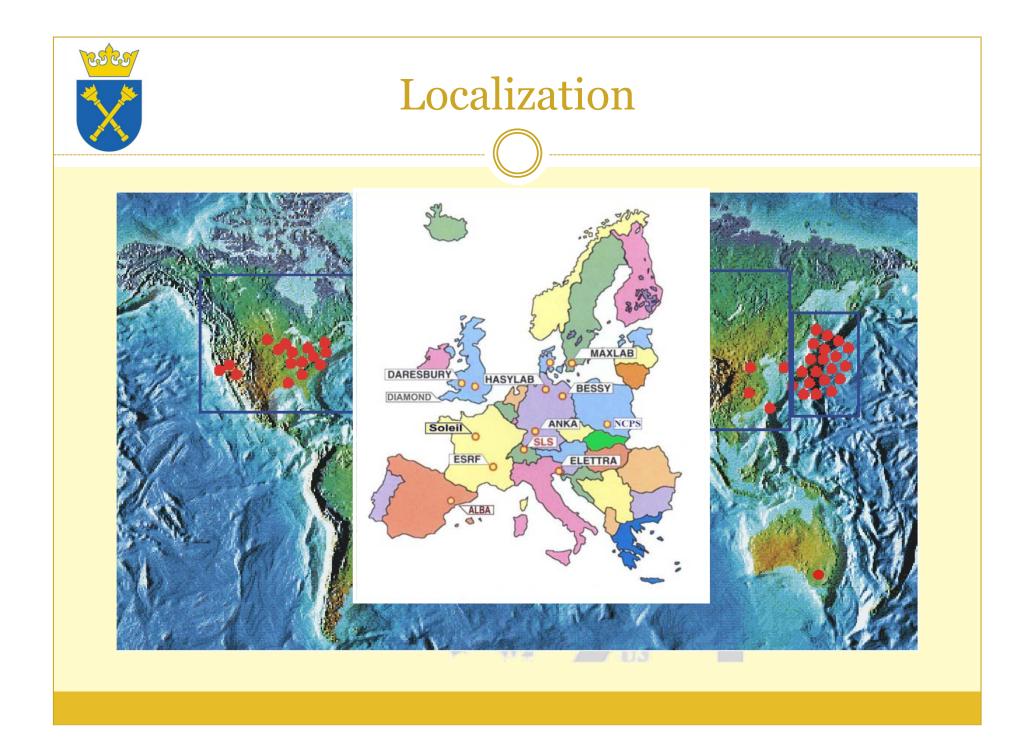
International Collaboration

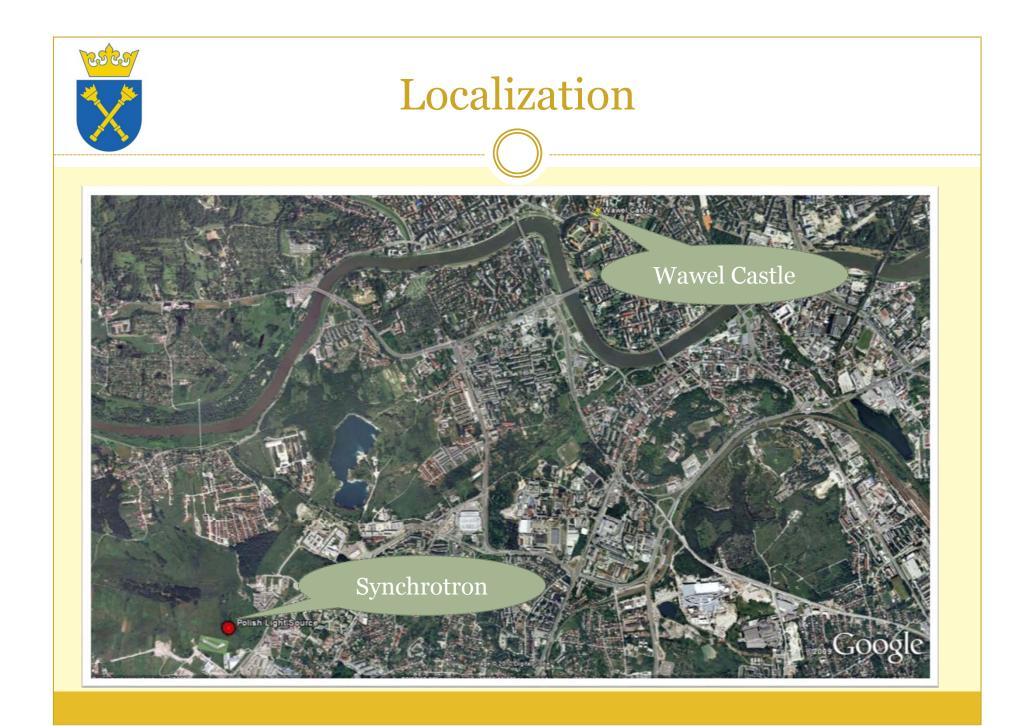
- 1. Agreement between MAX-lab, Lund University and Jagiellonian University (signed 20.12.2010)
 - Two identical 1.5 GeV storage rings ;
 - Design Project done by MAX-lab;
 - Tenders including option for SOLARIS;
 - Training 2 people (Piotr Goryl, Adriana Wawrzyniak);
 - Expertise;
- 2. Agreement with ALBA (Barcelona, Spain) negotitation
 - Cooperation regarding design of vacuum systems for MAX-lab and SOLARIS storage rings (NEG technology);
 - Training 1 person (Łukasz Walczak);
- 3. Agreement with Swiss Light Source PSI (Villigen, Switzerland)- negotitation
 - Training in RF systems 1 person (Piotr Tracz);
 - Cooperation in experimental beamlines contruction ;
- 4. Agreement with ELLETRA (Trieste, Italy) -negotiation
 - Apparatus winning;
 - Support in installation and start up of SOLARIS;
 - Cooperation in experimental beamlines contruction ;



Machine Parameters

- Injector: 500 MeV, ramping in ring (in future 1.5 GeV and top-up)
- Ring will be a copy of MAX IV 1.5 GeV
 - Energy: 1.5 GeV
 - Circumference: 96 m
 - Current: 500 mA
 - Horr. Emittance: 6 nm rad
 - Straights' Length: 3.5 m
 - Number of straight sections: 12 (9-10 for IDs)
 - RF frequency: 100 MHz
 - O Beam size in straights h/v: 184/13 μm
 - Energy spread: 0.075%









Acknowledgements

MAX-lab managers and experts

- Nils Martensson
- Mikael Eriksson
- P.F. Tavares, J. Modeer, D.Kumbaro, S. Werin, A. Andersson S. Leemann, M. Sjorstrom, S. Thorin, M. Johansson...many more
- PSI project support & training
- ALBA collaboration in the vacuum -Dieter Einfeld
- Polish synchrotron radiation users community
- Polish Synchrotron Radiation Users Society
- Polish Synchrotron Consortium 36 Polish research institutions
- people from Jagiellonian University Institute of Physics
- M. Stankiewicz, C. Bocchetta, K. Królas, P. Goryl, P. Tracz, Ł. Walczak...others





Welcome in 2014







Thank you for your attention ©