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Overview and current status of Solaris synchrotron light source

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Keywords: linac, storage ring, electron gun

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Solaris synchrotron light source accommodates 60 m long 600 MeV linear accelerator with thermionic electron RF gun and vertical transfer line, the 1.5 GeV storage ring with a circumference of 96 m, which is a replica of the MAXIV 1.5 GeV storage ring [1-3], and one bending magnet beamline in Phase I of the project.

Since Solaris linac is not a full energy injector, the electron beam is ramped up to the final operating energy in the storage ring[4].

The construction of the Solaris facility has started in 2010 and is planned to be finished in the last quarter of 2014. Majority of the machine components have been procured and some of them have already been delivered according to the schedule. In autumn 2013, right after building handover, the installation of the linac will start. This paper gives an overview and update on the facility status and installation time plan.

Acknowledgments: Work supported by the European Regional Development Fund within the frame of the Innovative Economy Operational Program: POIG.02.01.00-12-213/09. Authors would like to thank MAXIV team for all the support and know-how shared during the project.

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L-07

X-ray refractive optics

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Keywords: X-ray refractive optics, compound refractive lens,

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The utilization of refraction in the focusing of the X-rays started at 1996 when Snigirev and coworkers published first experimental proof of the use of Compound Refractive Lens (CRL) [1]. Presently many synchrotron and free electron leaser beam lines use refractive lenses for different purposes.

The advantages of refractive optics are: focusing along the primary beam axis, easy alignment, lower requirement for surface roughness, so they are easy to manufacture and are not expensive. In addition the refractive lenses can withstand powerful beam and, if necessary, can be easily cooled. The disadvantage of CRL is small effective aperture (~0.5 mm), however, taking to account small divergence of the radiation from modern undulators the loss of the flux is not big.

In the presentation the basic idea of the refractive optics is discussed. As the experimental example the refractive lens made of nickel used for Compton scattering experiments is shown [2, 3]. The review of the ideas of the increase of the effective aperture of CRL is finally presented.

Acknowledgments: The experiment was performed with approval of JASRI (Proposal No.2006B0097 and 2007B0097).

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