СОВРЕМЕННЫЕ КОМБИНИРОВАННЫЕ СВЕРХВЫСОКОВАКУУМНЫЕ НАСОСЫ ДЛЯ ЦКП «СКИФ»

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В настоящее время в вакуумных системах ускорителей заряженных частиц все чаще применяют комбинированные сверхвысоковакуумные насосы, т.е. насосы на базе нераспыляемых геттеров и магниторазрядных насосов в одном корпусе. Данный тип насосов будет применяться в синхротроне 4+ поколения ЦКП «СКИФ». В ИЯФ СО РАН был изготовлен и протестирован прототип комбинированного насоса с быстротой откачки по водороду 1000 л/с. Конструкция насоса, а также результаты измерений для различных газов представлены в данной статье.

Young scientist paper:

No

SR and FEL sources 1 / **58**

Status of the Kurchatov Synchrotron Radiation Source

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The Kurchatov synchrotron radiation source goes on to operate in the range of synchrotron radiation from VUV up to hard X-ray. Maximal electron current achieves 150 mA at 2.5 GeV, up to 12 experimental stations may function simultaneously. Improvement of the facility according Federal Program of KSRS modernization is in progress. At the end of 2021 manufacturing of third 181 MHz RF generator, new preliminary amplification cascades and new waveguides for all three generators was completed in Budker Institute (Novosibirsk). Control system modernization will be finished until the end of 2023. Also reconstruction of facility building ventilation system was completed including machine tunnel cooling. Preparation for great modernization of the whole facility according Federal Program for science infrastructure development is underway.

Young scientist paper:

No

Posters II - Board: 095 / **59**

Study of impurities accumulation in a thin lithium target by an ion scattering spectroscopy

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An accelerator based epithermal neutron source (VITA) is proposed, created and is functioning at the Budker Institute of Nuclear Physics. VITA includes an originally designed tandem electrostatic particle accelerator (vacuum-insulated tandem accelerator) to produce a monoenergetic beam of protons or deuterons with energies from 0.3 to 2.3 MeV, currents up to 10 mA, and a thin lithium target to generate a powerful neutron flow in 7Li(p,n)7Be and Li(d,n) reactions. The facility is used to develop a boron neutron capture therapy and many other applications. It is known from literature sources that heavy impurities in the composition of a lithium target significantly decrease the neutron yield and make the target unusable. The purpose of this work was to study the accumulation of impurities in a thin lithium target.
The elemental composition of the sample was determined by an ion scattering spectroscopy. The composition of the lithium layer immediately after evaporation onto a copper substrate was determined in the experiments. The interaction of lithium with air and the effect of the impurities on the neutron yield were studied. The accumulation of impurities during proton beam irradiation of the target at a beam power density of 1 kW/cm2 and up to 3.4 kW/cm2 was investigated.

This research was funded by Russian Science Foundation, grant number 19-72-30005, https://rscf.ru/project/19-72-30005.

Young scientist paper:

Yes

Posters I - Board: 040 / **60**

METHODs FOR CHARACTERIZING AN ECR ION SOURCE USING A PEPPER-POT EMITTANCE METER

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Ion sources often generate beams in which, in addition to the working type of ions, there is a spectrum of parasitic charged particles that mask the main current and make it difficult to correctly measure the source parameters. The article describes a technique for measuring the characteristics of a working-type ion beam by separating it from a full beam from a source from the measurements results by the pepper-pot method. The article describes an ECR ion source and a measuring device, a technique for identifying and separating spots of various types of ions from a scintillator image, calculating their characteristics, a method for identifying a helium ion beam, and presents the results of measuring the characteristics of a helium ion beam at the source output.

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