

Synchrotron and Free electron laser Radiation: generation and application (SFR-2020)

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Книга абстрактов Международной конференции по генерации и использованию синхротронного и терагерцового излучения.

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Настоящий сборник абстрактов является рабочим документом Международной конференции по генерации и использованию синхротронного и терагерцового излучения SFR-2020, организованной ИЯФ СО РАН, г. Новосибирск, с 13 по 16 июля 2020 г. Книга предназначена для научных сотрудников и инженеров, занимающихся исследованиями на синхротронном, терагерцовом излучении, разработкой элементов ускорителей заряженных частиц, а также может быть полезной студентам и аспирантам соответствующих специальностей.

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experiments in each series referred to an individual case of spacial position of interesting field of spread function along the axial direction.). We selected the range of the cases of the detected spread functions in order to be proceed by the quantitative analysis (approximation) those refer to the cases of most good quality of lens' adjustment. After that a various of approximation models (asymmetrical gaussians, extreme, logistpk, lorentz peaks [2], some our models) were tested by us. As the result it was shown that most good results refer to the cases of the extreme peaks approximation model additionally modified by us. The scanning experiments were carried out at Synchrotron and Terahertz Research (INP SB RAS, Novosibirsk) and the Kurchatov Complex of Synchrotron-Neutron Research (KISI, Moscow) using a confocal X-ray microscope. The work was carried out in the framework of the RFBR projects no. 19-05-50046. The work was partly done at the shared research center SSTRC on the basis of the VEPP-4-VEPP-2000 complex at BINP SB RAS, using equipment supported by project RFMEFI62119X0022.

[1] Mantouvalou, W. Malzer, and B. Kanngiesber, "Quantification for 3D Micro X-ray Fluorescence," *Spectrochimica Acta. Pt. B* 77, 9–18 (2012).

[2] http://www.originlab.com/pdfs/16_CurveFitting.pdf

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ON THE EFFICIENCY OF BACKWARD COLLINEAR ACOUSTO-OPTIC INTERACTION BETWEEN TERAHERTZ RADIATION AND ACOUSTIC BEAM IN HEXANE

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Description

One of the leading areas in telecommunication technology is the development of high-speed devices. At present, the use of the acousto-optical (AO) effect to control radiation is promising. Devices based on this effect are used in the ultraviolet, visible and infrared ranges. One of the main problems of using the AO effect in the terahertz (THz) range is the low diffraction efficiency (four orders of magnitude less than in the visible range) due to an increase in the radiation wavelength. This work is devoted to modeling the operation of the AO filter of a THz radiation, in which the collinear geometry of the interaction of the radiation beam with the ultrasound beam is used. In contrast to the well-known works in which the sound beam was assumed to be homogeneous and the chalk plane wave front, we used the model structure of the sound beam. The nonpolar liquid hexane (C₆H₁₄) was chosen as the AO interaction medium, since it is characterized by acceptable values of transparency and attenuation of ultrasound. The work was supported by RSF grant No.18-12-00430.

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LUMINESCENT SPECTROSCOPY OF Pr³⁺ IONS IN SOME PHOSPHATES, BORATES AND SILICATES USING X-RAY SYNCHROTRON RADIATION FROM VEPP-3 STORAGE RING

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Description

This paper reports the spectroscopic properties of praseodymium-doped phosphates, borates and silicates. Spectra of X-ray excited luminescence and its decay kinetics were measured. Studied samples demonstrate interconfigurational 5*d*-4*f*, intraconfigurational 4*f*-4*f* transitions and defect-related luminescence. Comparative analysis of spectroscopic properties and application perspectives is presented.

Inorganic scintillating materials are being actively investigated in terms of their application in fields of nuclear physics, medicine tomography and detecting systems. Ce³⁺ ions impurity are widely used, but praseodymium ions are able to shift the emission spectra of interconfigurational