IPAC 2020 Search

Vasili Mkrtich Tsakanov

ID: 3749 Interaction of TE01 Mode with a Particle in a Two-Layer Metal-Dielectric Cylindrical Waveguide

Presenter Michael Ivanyan (CANDLE SRI, Yerevan)

Authors Michael Ivanyan, Lusine Vrezh Aslyan (CANDLE SRI, Yerevan), Vasili Mkrtich Tsakanov (CANDLE SRI, Yerevan; YSU, Yerevan)

Abstract The possibility of focusing a relativistic particle in a two-layer metal-dielectric waveguide with outer copper wall, using the synchronous TE01 waveguide mode, is considered. The equations of motion are solved and the trajectory of the particle is traced.

Funding Agency

Type of Presentation Poster

Main Classification MC5: Beam Dynamics and EM Fields

Sub Classification D03 Calculations of EM Fields - Theory and Code Developments

ID: 3731 Transition Radiation in a Semi-Infinite Resistive Waveguide

Presenter Michael Ivanyan (CANDLE SRI, Yerevan)

Authors Michael Ivanyan, Lusine Vrezh Aslyan (CANDLE SRI, Yerevan), Vasili Mkrtich Tsakanov (CANDLE SRI, Yerevan; YSU, Yerevan)

Abstract The transverse resonance properties of a two-layer cylindrical metal-dielectric waveguide are considered. The comprehensive study of transverse impedances, wake functions, and dispersion relations of corresponding modes made it possible to reveal the peculiarities of resonance characteristics of a waveguide with thick and thin dielectric loads and to substantiate the preference for using the latter as a single-mode structure.

Funding Agency

Type of Presentation Poster

Main Classification MC5: Beam Dynamics and EM Fields

Sub Classification D03 Calculations of EM Fields - Theory and Code Developments

ID: 3747 Transverse Wakes and Impedances in a Circular Metal-Dielectric Waveguide

Presenter Michael Ivanyan (CANDLE SRI, Yerevan)

Authors Michael Ivanyan, Lusine Vrezh Aslyan (CANDLE SRI, Yerevan), Vasili Mkrtich Tsakanov (CANDLE SRI, Yerevan; YSU, Yerevan), Klaus Floettmann, Francois Lemery (DESY, Hamburg)

Abstract The transverse resonance properties of a two-layer cylindrical metal-dielectric waveguide are considered. The comprehensive study of transverse impedances, wake functions, and dispersion relations of corresponding modes made it possible to reveal the peculiarities of resonance characteristics of a waveguide with thick and thin dielectric loads and to substantiate the preference for using the latter as a single-mode structure.

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Main Classification MC5: Beam Dynamics and EM Fields

Sub Classification D03 Calculations of EM Fields - Theory and Code Developments

ID: 3730 Transition Effects of THz Helical Undulator Radiation in a Waveguide

Presenter Bagrat Sargsyan (CANDLE SRI, Yerevan)

Authors Bagrat Sargsyan, Michael Ivanyan (CANDLE SRI, Yerevan), Armen Grigoryan, Vasili Mkrtich Tsakanov (CANDLE SRI, Yerevan; YSU, Yerevan)

Abstract The coherent THz radiation sources are powerful tools for a wide range of applications. It is given that in the presence of a small aperture waveguide the radiation energy of the helical undulator is redistributed among discrete modes of the waveguide. The radiation of the point charge, following the helical orbit in the circular waveguide with ideally conducting walls, is investigated under initial conditions. To observe the process of energy redistribution and to find the length of the steady state regime the transition effects of helical undulator radiation are examined.

Funding Agency

Type of Presentation Poster

Main Classification MC5: Beam Dynamics and EM Fields

Sub Classification D03 Calculations of EM Fields - Theory and Code Developments

ID: 4296 Synthesis of BTO-BFO Based Ceramics as Electrical Controllable Fast Phase Shifting Components

Presenter Norayr Martirosyan (CANDLE SRI, Yerevan)

Authors Norayr Martirosyan, Gayane A. Amatuni, Bagrat Grigoryan, Khachatur Kirakosyan, Vasili Mkrtich Tsakanov (CANDLE SRI, Yerevan), Ruzanna Ghazaryan, Gegham Karoyan, Mariam Mkrtchyan, Tigran Vandunts (NPUA, Yerevan)

Abstract Mn and Mg doped (1-x)BiFeO3-xBaTiO3 (BFO-BTO) multiferroics are attractive due to their high dielectric constant, low losses and good piezoelectric properties. These properties may be controlled by external electric fields. These materials offer significant benefits and can be the basis as new advanced components for development of new concepts of high-gradient accelerating techniques, particular, the production of electric field controlling ultrafast facilities for 0.7-20 GHz RF phase shifting and amplitude modulation. A SHS technology to produce high-quality ceramics based on BFO-BTO has been developed. The general parameters of the SHS process (temperature and propagation velocity of the combustion front) are measured. The dependences of microstructure (grain size, density, and porosity of the samples) on compaction and sintering thermodynamic variables, such as the pressing pressure and duration, sintering temperature, sintering duration and atmosphere, heating and cooling rates are experimentally investigated. The phase structure investigation by X-ray diffraction and Rietveld refinement shows the formation of single-phased materials crystallized in a perovskite structure.

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Type of Presentation Poster

Main Classification MC7: Accelerator Technology

Sub Classification T08 RF Power Sources

ID: 4870 AREAL RF Photogun With Integrated DELTA Stations for the Micro-Fabrication and Two-Photon Microscopy. Facility and Applications

Presenter Vasili Mkrtich Tsakanov (CANDLE SRI, Yerevan)

Authors Vasili Mkrtich Tsakanov, Gayane A. Amatuni, Zohrab Amirkhanyan, Vardan Avagyan, Anna Eduard Ayvazyan, Hakob Davtyan, Vladimir Sergey Dekhtiarov, Bagrat Grigoryan, Michael Ivanyan, Vitali Khachatryan, Vahe Sahakyan, Artsrun Sargsyan, Avetis Samvel Simonyan, Ashot Vardanyan, Arsham Yeremyan, Gevorg Suren Zanyan (CANDLE SRI, Yerevan), Hrant Nikolay Yeritsyan (ANSL, Yerevan), Andreyan Nikolay Osipov, Natalya Vorobyeva (Burnasyan Federal Medical Biophysical Center, Moscow), Stepan Tatikian (CANDLE, Yerevan), Andranik Tsakanian (HZB, Berlin), Elina Aleksander Arakelova (IMB, Yerevan), Gohar Vasili Tsakanova (IMB, Yerevan; CANDLE SRI, Yerevan), Ruben Mikhail Aroutiounian, Yeva Beno Dalyan, Samvel Garnik Haroutiunian, Maxim Sargsyan (YSU, Yerevan), Nelly Samvel Babayan (YSU, Yerevan; IMB, Yerevan)

Abstract High power ultrafast lasers are widely used in the development of the advanced scientific facilities for fundamental and applied sciences. The AREAL is a laser-driven RF gun based linear accelerator project designed as a multipurpose facility in the fields of new accelerator technology and applied research. Along with the facility first stage, a 5 MeV energy RF photogun, the DELTA experimental stations for laser micro-fabrication and two-photon microscopy have been installed. The facility driven by the same laser provides the reliable simultaneous operation of the AREAL linac for ultrafast electron irradiation experiments and the DELTA experimental stations. The overview of the facility design and experimental results in the fields of life and material sciences is presented.

Funding Agency

Type of Presentation Poster

Main Classification MC8: Applications of Accelerators, Technology Transfer, Industrial Relations and Outreach

Sub Classification U05 Other Applications

ID: 3443 Experimental Educational Program on Advanced Accelerator Physics and Technology at the AREAL Facility

Presenter Vasili Mkrtich Tsakanov (CANDLE SRI, Yerevan; YSU, Yerevan)

Authors Vasili Mkrtich Tsakanov (CANDLE SRI, Yerevan; YSU, Yerevan), Suren Arutunian (ANSL, Yerevan), Gayane A. Amatuni, Zohrab Amirkhanyan, Hakob Davtyan, Vladimir Sergey Dekhtiarov, Bagrat Grigoryan, Vitali Khachatryan, Vahe Sahakyan, Artsrun Sargsyan, Ashot Vardanyan, Arsham Yeremyan (CANDLE SRI, Yerevan), Klaus Floettmann (DESY, Hamburg), Wolfgang Carl Albert Hillert, Velizar Miltchev (University of Hamburg, Hamburg), Jörg Rossbach (University of Hamburg, Hamburg; DESY, Hamburg), Armen Grigoryan (YSU, Yerevan; CANDLE SRI, Yerevan)

Abstract An advanced educational program on accelerator physics and technology has been developed in a close collaboration of Universität Hamburg, Yerevan State University, Yerevan Physics Institute, CANDLE, and DESY. It is based on the available infrastructure and experienced personnel at the running AREAL facility at CANDLE, comprising a 5 MeV laser-driven electron RF gun and associated dedicated laboratories. This year, the experimental program has been carried out for the first time in the framework of a newly set up German-Armenian student practical course offered to undergraduate students of both collaborating universities. It includes topics on ultrashort electron beam generation and acceleration, beam physics and diagnostics, ultrafast lasers technique and manipulations, beam matter interaction and radiation safety, radio-frequency technique, magnets and magnetic fields, vacuum technology and measurements. Each topic is integrated in the AREAL facility's experimental program providing the students with additional knowledge of the required sub-systems and their role in accelerator operation. We report on the first results of the course which took place in October 2019.

Funding Agency German Federal Foreign Office under the program Expanding Cooperation with Civil Society in the Eastern Partnership Countries and Russia

Type of Presentation Poster

Main Classification MC9: Session on Engagement with Industry, Knowledge Exchange and Industrial Relations

Sub Classification T29 Knowledge Exchange

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