



Contribution ID: 81

Type: poster

Cherenkov diffraction radiation generated by 3D printed plastic samples

Tuesday, 10 September 2024 18:35 (1 hour)

In this study, a series of experimental samples were produced using the fused filament fabrication technique. The set comprised dielectric wafers printed from a variety of polymers, including polyethylene terephthalate glycol (PETG), polylactide (PLA), acrylonitrile butadiene styrene (ABS), high impact polystyrene (HIPS), styrene-acrylonitrile (SAN) and PLA with differing concentrations of impurities, including copper, bronze, carbon and wood fibre powder. A terahertz laser was applied to measure the refractive index and absorption plus reflection coefficient. Based on the data obtained, the most optimal materials were selected, from which test samples with a special geometry were manufactured for the ChDR generation.

A series of experiments was conducted at the MT-25 microtron in Dubna to investigate the generation of ChDR in the created samples when the electron beam passed parallel to their surface. Subsequently, the super-radiant spectrum of the generated radiation on several harmonic lines was investigated using a spectrum analyser. The data obtained were compared with the ChDR generated under identical conditions by a Teflon radiator manufactured by standard milling from cast material.

Primary authors: KUBANKIN, Alexander (Belgorod National Research University); BULAVSKAYA, Angelina; BALDIN, Anton (Joint Institute for Nuclear Research); KLENIN, Artemiy (Belgorod State National Research University, 85 Pobedy str., Belgorod 308015, Russia); KIDANOVA, Ekaterina (Belgorod State National Research University, 85 Pobedy str., Belgorod 308015, Russia); BUSHMINA, Elizaveta (Joint Institute for Nuclear Research); MILOICHIKOVA, Irina; KISHIN, Ivan (Belgorod State National Research University, 85 Pobedy str., Belgorod 308015, Russia); NOZDRIN, Mikhail (Joint Institute for Nuclear Research); KARATAEV, Pavel (Royal Holloway, University of London); STUCHEBROV, Sergei (Tomsk Polytechnic University); ALEXEEV, Sergey (Joint Institute for Nuclear Research); KOCHARYAN, Vahan (Institute of Applied Problems of Physics of NAS RA, 0014, Hr. Nersisyan str. 25, Yerevan, Armenia.); MARGARYAN, Vardan (Institute of Applied Problems of Physics of NAS RA, 0014, Hr. Nersisyan str. 25, Yerevan, Armenia); BLEKO, Vitold (National Research Tomsk Polytechnic University)

Presenter: KARATAEV, Pavel (Royal Holloway, University of London)

Session Classification: Poster session 2