

Smart Metal Oxide Nanocoatings and HIPIMS Technology

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I N V E S T I N G I N Y O U R F U T U R E

Project number: 1.1.1.1/18/A/073

Duration of the project: 01.03.2019. – 28.02.2022.

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The project is realized in collaboration between the Institute of Solid State Physics University of Latvia (ISSP LU) and the vacuum coating SME company Sidrabe Vacuum Ltd.

04.07.2019.

About project implementation (01.03.2019 - 30.06.2019)

Project No.1.1.1.1 / 18 / A / 073 “Smart Metal Oxide Nanocoatings and HIPIMS Technology” in its start-up phase was performed preparation and equipping of laboratory equipment (LU CFI and SIA Sidrabe Vacuum) for planned technological research, as well as studies were started project activity “Development of reactive R-HiPIMS TMO thin film sputtering technology” and “Development of reactive R-HiPIMS coating of thin film TMO technology”. Installation and adjustment of the magnetrons and HIPIMS system required for the study and the adjustment of the vacuum system to the roll-to-roll coating process with two magnetrons, as well as research of the possibilities of technical solutions to ensure the process of the R-HIPIMS reactive magnetron sputtering. The control system of the parameters of reactive magnetron sputtering process has been developed.

Practical calculations using the CRYSTAL computer program have been started within the project activity “Computer modeling of TMO and TMO / TCO”. According to the study plan, several computer calculations were made. The zinc oxide superconductor was modeled with an iridium atom as a substitution defect and with additional node oxygen atoms. Several possible defect deployment configurations have been obtained and a description describing them is being prepared. The report “The hybrid density calculations of Ir-doped ZnO” was adopted at the scientific conference “E-MRS 2019 Fall Meeting” in the form of an oral presentation.

Within the project activity “Characterization of the obtained TMO and EC samples” thin films of ReO_3 were obtained and research was started using LU CFI equipment: UV-VIS, XRD, Raman method.