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DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

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MBE-grown II-VI visible/solar-blind UV sensors

by

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ABSTRACT

In this presentation, a number of MBE-grown solar/visible-blind ultra-violet sensors based on II-VI chalcogenide compounds will be addressed, which included ZnSSe, MgS and CaS sensors. In developing the CaS detector system, a novel growth technique, named seed-layer-assisted growth, was invented to overcome the challenge in fabricating a rocksalt thin film on a zincblende substrate. It will be shown that this novel growth method could be used to achieve high-quality SnTe topological crystalline insulator thin film structures. The results of characterizations performed on the CaS thin films and their devices using RHEED and HRXRD together with their I-V characteristics, response time and photorespone will be presented to reflect its potential as the active material for flame sensing applications.

BIOGRAPHY

Prof. Iam Keong Sou currently is a professor in the Department of Physics, The Hong Kong University of Science and Technology (HKUST). He got his PhD in physics at University of Illinois at Chicago. He has been a faculty member in the Department of Physics at HKUST since July 1991. From June to September in 1992, he carried out visiting research in the Department of Physics at Northwestern University (USA). During 2001-2005, he served as the vice president of the Physical Society of Hong Kong . He was a member of the Asia-Pacific Advisory Committee of Institute of Physics (IOP) in 2010. Currently Prof. Sou's researches focus on molecular beam epitaxial growth of low-dimensional metallic and semiconductor nanostructures, topological insulator materials, UV optoelectronic materials and devices. He has published more than 160 papers including publications in Nature Communications, Physical Review Letters, Advanced Materials, Small, etc. He owns 4 U.S. patents, one Australian patent and one Chinese patent. His invented visible & solar-blind UV detector technology has been

successfully commercialized and the UV sensors have been adopted in world-wide consumer products such as wrist watches, personal UV monitors, walkie talkies and sunglasses testers. He is a co-recipient of The 2012 Macau Special Administrative Region Technological Invention Award.

ALL ARE WELCOME!