Contribution ID: **407** Type: **Oral Presentation**

Emergent Property Sets & Applications of Beta-Gallium Oxide

Thursday, 28 June 2018 14:00 (1 hour)

Recently, there has been a surge in interest for the wide bandgap (Eg ˜ 4.9 eV) semiconductor gallium oxide (Ga2O3). A key driver for this boom is that single crystal wide area bulk β-Ga2O3 substrates have become commercially available [1] and a variety of methods have been shown to give high quality epitaxial growth [2,3].
Although Ga2O3 has a number of polymorph forms (α-, β-, γ-, δ- and ε) the more stable monoclinic phase (β-Ga2O3) has attracted the most attention. Amongst a whole range of potential applications power electronics, solar-blind photodetectors and UVC transparent electrodes offer exciting perspectives [3-5].
In this talk we give an overview of these applications illustrated with examples from the β-Ga2O3 development work carried out at the French oxide epiwafer start-up, Nanovation [4-7].
[1] http://www.tamura-ss.co.jp/en/products/gao/index.html
[2] http://nanovation.com/en/products/
[3] M. Razeghi, D. J. Rogers et al. Proc. SPIE 15330 (2018) 15330 O R-1
[4] D. J. Rogers et al. Proc. SPIE 15330 (2018) 15330 O R-1
[5] A. Perez-Tomas, D. J. Rogers et al. Proc. SPIE 15330 (2018) 15330 1 Q-1
[6] F. H. Teherani, D. J. Rogers et al. Proc. SPIE 10105 (2017) 10105 1 P-1
[7] E. Chikoidze et al. Materials Today Physics 3 (2017) 118

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Session Classification: Plenary

Track Classification: Track H - Plenaries