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Structural, Optical and Carrier Dynamics of Self-Assembled InGaN nanocolumns on Si(111)

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1	Structural, Optical and Carrier Dynamics of Self-Assembled InGaN nanocolumns
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3 4 5 6 7 8	Praveen Kumar ^{1,*} , Pooja Devi ^{1,*} P. E. D. Soto Rodriguez ² , Rishabh Jain ¹ , Neena Jaggi ^{4,} R. K. Sinha ¹ and Mahesh Kumar ³ ¹ CSIR-Central Scientific Instruments Organisation, Sector-30C, Chandigarh-160030 India ² Physics of Energy & Harvesting group, National Physical Laboratory, New Delhi, 110012 India ³ ISOM, Universidad Politécnica de Madrid, Ciudad Universitaria s/n, Madrid, 28040 Spain ⁴ Department of Physics, National Institute of Technology, Kurukshetra, 136119 India
9	Abstract:
10	We investigated the morphological, structural, optical, electrical and carrier
11	relaxation dynamic changes on the self-assembled grown InGaN
12	nanocolumns(NCs)directly on p-Si(111) substrate at two different substrate
13	temperature, namely 580°C (A) and 500°C (B). The emission wavelength of comparably
14	low temperature (LT)grown NCs was red shifted from 3.2eV to 2.4eV.First observations
15	on the charge carrier dynamics of these directly grown NCs show comparable broad
16	excited state absorption (ESA) for LT gown NCs, which manifest bi-exponential decay
17	due to the radiative defects generated during the coalescence of these NCs.
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19	Keywords: InGaN; Self-assembled NCs; Si(111); UFS
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