



पदार्थ अभियांत्रिकी एवं निरूपण में
आयन बीम पर 7वाँ अंतरराष्ट्रीय
सम्मेलन (आईबीएमईसी-2022)

नवंबर 16-19, 2022

7th International Conference on
Ion Beams in Materials
Engineering and Characterization
(IBMEC-2022)

November 16-19, 2022

सार पुस्तिका
Abstract Booklet

अंतर-विश्वविद्यालय त्वरक केंद्र, नई दिल्ली, भारत
Inter-University Accelerator Centre, New Delhi, India

P-10	Utilizing the Potential of micro-Raman Spectroscopy to Investigate the Phase-Transitions in Calamitic Liquid-Crystalline Materials	Satyabratt Pandey	50
P-11	The grain size effect in Gd ₂ O ₃ -CeO ₂ upon 400 KeV Kr ⁺ ions irradiation and its radiation tolerance	Waseem Ul Haq	51
P-12	Catalytically induced nanographites by nickel-ion implantation/annealing process to improve the microplasma illumination properties of boron-doped diamond films	Salila Kumar Sethy	52
P-13	A review and tabulation for XRP cross sections for Oxygen and Carbon ion impact	Vasu Khurana	53
P-14	Tailoring the Properties of Oxygen Deficient Hafnium Oxide (HfO ₂) Thin Films by Ion Beam Irradiation	Sikita Mandal	54
P-15	Defect Microstructure during Successive Cascades in model Fe-Ni-Cr alloy studied using MD Simulation	Soumita Chakraborty	55
P-16	Study of Dielectric Properties of Biodegradable Polymer with Inverse Spinel Iron Oxide Nanomaterial	Manisha Verma	56
P-17	Low energy ion-beam induced pattern formation on sputtered Al films for achieving manifold SERS enhancement	Mahesh Saini	57
P-18	Ultrafast Laser Ablation of Gamma Irradiated Silicon	Ravi Kumar	58
P-19	Metallic oxide thin film formation on Si surface by low energy O ⁺ ion implantation	Dipak Bhowmik	59
P-20	Ion Beam Induced Epitaxial Recrystallization of Si/SiO ₂ Heterostructure by 100 MeV Ni ⁷⁺ ions	Sourav Bhakta	60
P-21	Formation of rust-free hematite nano-network through low-energy ion irradiation	Shyamapada Patra	61
P-22	Thermal spike effects in swift heavy ion irradiated zirconolite	Merry Gupta	62
P-23	Impurity phase dissolution and lattice parameter variation by swift heavy ion irradiation in MgO/Si (100) thin films	Shaffy Garg	63
P-24	Phonon scattering in carbon ion implanted rutile TiO ₂ micro-flowers	Subhashree Sahoo	64
P-25	Influence of 200 MeV Ag ¹⁵⁺ swift heavy ion irradiations on the electronic band structure of epitaxial lanthanum nickelate thin film	Sunidhi	65

Ultrafast Laser Ablation of Gamma Irradiated Silicon

Kanaka Ravi Kumar¹, R. Sai Prasad Goud², A. Mangababu¹, Dipanjan Banerjee³, Arshiya Anjum⁴, A.P. Gnana Prakash⁴, A. P. Pathak¹, S Venugopal Rao^{3*} and S.V.S. Nageswara Rao^{1,2#}

¹*School of Physics, University of Hyderabad, Hyderabad-500046, Telangana, India*

²*Centre for Advanced Studies in Electronics Science and Technology (CASEST), University of Hyderabad, Hyderabad-500046, Telangana, India*

³*Advanced Centre of Research in High Energy Materials (ACRHEM), DRDO Industry Academia – Centre of Excellence (DIA-COE), University of Hyderabad, Hyderabad 500046, Telangana, India*

⁴*Department of Studies in Physics, University of Mysore, Manasagangothri, Mysuru-57006, Karnataka, India,*
[*soma_venu@uohyd.ac.in](mailto:soma_venu@uohyd.ac.in), [#nageshphysics@gmail.com](mailto:nageshphysics@gmail.com)

In this work, we will present results from our studies on the ultrafast laser ablation of ⁶⁰Co Gamma irradiated Silicon. The effects of Gamma-irradiation on the resistivity of Si having different dopant concentrations and subsequent effects on the process of laser ablation will be discussed. The lightly doped Si (ρ_1 : 1-10 Ω cm) and heavily doped Si (ρ_2 : 0.001-0.002 Ω cm) were subjected to ⁶⁰Co Gamma irradiation at different doses (0.1, 1, 3, 6, 10 Mrad). It has been observed that the resistivity of pre-irradiated Si has altered with Gamma irradiation due to the creation of defects. The irradiated Si substrates will be utilized to fabricate Si nanoparticles by employing femtosecond/picosecond laser ablation technique. The dependence of initial resistivity on the structural and optical properties of resulting Si nanoparticles/nanostructures will be investigated. Details of all the characterizations and results will be discussed in the presentation.