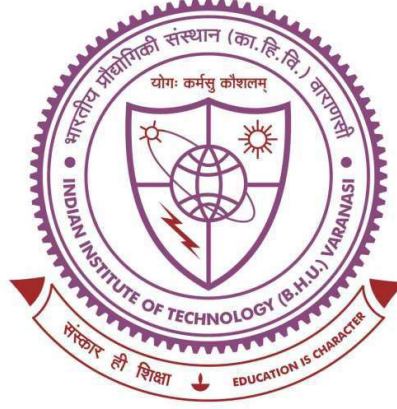


***Design and analysis of some surface plasmon
resonance based photonic crystal fiber refractive
index sensors***



**Thesis submitted in partial fulfilment for the
Award of Degree**

Doctor of Philosophy

in

Physics

by

Umang Ramani

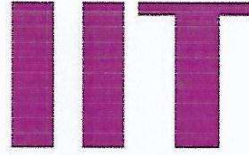
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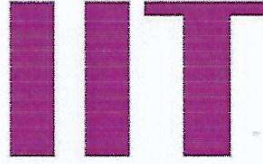
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Acknowledgments

Foremost, I express my deep sense of gratitude to my research supervisor Dr. Praveen Chandra Pandey for his excellent guidance, motivation, and constant encouragement during my entire research work. The completion of this research work is indeed an outcome of his support, valuable ideas, and suggestions. The insightful discussion with him always provided me with great enthusiasm.

I express my gratitude to the Head of the Department for providing me required facilities. I am extremely thankful to my RPEC members Dr. Shail Upadhyay and Dr. Amritanshu Pandey for the invaluable inspiration, kind support, and numerous insightful suggestions during the entire course of this research.

I use this opportunity to express my gratefulness to all the faculty members of the Department of Physics for their kind encouragement and motivation during my research period. I am also thankful to the entire non-teaching staff of the Department of Physics.

I wish to thank my senior Dr. Bipin Kumar and my lab companions and friends Hemant Kumar, Raj Kumar, Vaibhav Chauhan, Prashant Pandey, Prashant Dixit, Satyam, and Sanket for providing me with a conducive environment to carry out my research work.

I would also like to express my sincere appreciation to my colleagues and dearest friends Digvijay, Rohit, Abhishek, Balveer, Vivek, Md. Alam, Nandkishor, Asim Aftab and all research scholars of the department for their lively friendship and continuous support at all stages of my research.

I feel short of words to express my appreciation, gratitude, and indebtedness to my family members, my father Shri Rajesh Ramani, and mother Smt. Farah Ramani, Sister Kirti Ramani, Wife Mrs. Jyoti Daryani, and her whole family for their unbounded love, blessings, encouragement, and support during my entire academics.

Many others that have been involved also deserve recognition. It is, however, not possible to list them all here. Their support in this effort is, however, greatly appreciated.

Finally, I am grateful to the Almighty for giving me the patience to make this endeavor a success.

Sincerely

(Umang Ramani)

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Nomenclature

TIR	Total internal reflection
PCF	Photonic crystal fiber
SPW	Surface plasmon wave
SPP	Surface plasmon polariton
SPR	Surface plasmon resonance
PCs	Photonic crystals
EM	Electromagnetic
PBG	Photonic band gap
OFS	Optical fiber sensor
SMF	Single mode fiber
MMF	Multi mode fiber
M – TIR	Modified total internal reflection
FDFD	Finite difference frequency domain
FDTD	Finite difference time domain
FEM	Finite element method
n_{eff}	Effective mode index
n_{core}	Refractive index of core
$n_{cladding}$	Refractive index of core
RF	Radio frequency
β	Propagation constant
SP	Surface plasmon

ATR	Attenuated total reflection
PDE	Partial differential equation
S_λ	Wavelength sensitivity
S_A	Amplitude sensitivity
R	Resolution
TE	Transverse Electric
TM	Transverse Magnetic
Au	Gold
Cu	Copper
Ag	Silver
TiO₂	Titanium di oxide
PML	Perfect match layer
Δn_a	Change in analyte refractive index