

Acknowledgements

It is a moment of gratification and pride to look back with a sense of contentment at the long traveled path, to be able to recapture some of the finest moments, to be able to thank infinite number of people, some who were with me from the beginning, some who joined at some stage during the journey, whose kindness, support, love and blessings have brought this day. I wish to thank each one of them with all my heart.

Words seem insufficient to express my deep sense of gratitude towards my respected guide Prof. S. Mukherjee. I am privileged by working under his guidance. I feel myself extremely lucky to have such a wonderful person as a guide. He has boosted my moral with constant encouragement, keen interest in my research, positive attitude and enduring support. His wife Mrs. Chandana Mukherjee has also played a very important role in this journey. She is amazingly creative and quite a positive woman. Her witty nature and unending support has made my work easier and delightful.

I would like to convey my gratitude towards Dr. Haladhara Naik for making the experimental work possible. I have learnt a lot under his guidance. I will always be grateful to him for giving me the opportunity to grow in the field of experimental nuclear physics. I express my sincere gratitude towards him for providing me all the necessary samples, experimental facilities and accommodation during my stay at BARC. My sincere thanks to each and every member from BARC-TIFR, who has directly or indirectly helped me in my research work.

I would like to express my obligation to our Head, Department of Physics for providing the atmosphere for qualitative research work. His positive attitude has always motivated us. His enthusiasm and energy is implacable.

My Sincere thanks to Dr. S. V. Suryanarayana for his timely help, guidance & support, during my project work. His simplicity and kindness has taught me to stay grounded even when you achieve heights. I am extremely thankful to Dr. Yashwant Naik and his wonderful wife Nanda Naik for making me feel like home when I was far away from home. They are so kind and selfless people. I will always cherries the memories I have shared with them during my stay at BARC colony, Mumbai.

Heartfelt thanks to my Rao sir, Basu sir, Bhawna madam, Pareshbhai, Dr. Dipika didi, Dr. Rajnikantbhai for their invaluable support and guidance in the very beginning and

boosting my confidence throughout the course of Ph.D. I acknowledge deep gratitude for the help provided by Dr. Rajnikantbhai and Dr. Karel Kotovski for the generation of all the neutron spectra using MCNP for the present work. My sincere thanks to siddharth for his help in covariance analysis.

I want to express my sincere thanks to Nimeshbhai, Mudra, Nidhi, Shesha, Meghana, Bhumi, Kalpana, Deepa, Tripti, Dimple, Hemal, Chhavi, Parth, Gnansagarbhai, Mayurbhai, Rakeshbhai, Prajaktadidi, Ketan sir, Vishwanath bhai and Shraddha didi, for their support, constant encouragement, advices and unending assistance in my work. Special thanks to my special friends Biolletty, Reetuparna, Silviya, Shanthi didi and Meghana for accompanying me during the stay at BARC and TIFR. I am glad that through the course of my research work I could meet them and spend good time with such amazing people. They have helped me a lot to build up the strength and patience.

My sincere thanks to all the inspiring teachers Prof. N. L. Singh, Devi madam, Nilesh Purohit sir, Dr. Anita Gharekhan, Bhavin Pandya sir, Dr. Dipak Gadani, Nirmal Sir, P. H. Patel sir, P. S. Patel sir, Oza sir, Nipa mam, Dr. Ashvin Prajapati, Dr. P. R. Vyas, Dr. Dipti, Dr. Jotania, Dr. M. E. James, Dr. Pruthul Desai, for their guidance & motivation. All these great teachers, their dedication for work and simplicity have taught me good moral values. They have a big role in making me a good human being. My sincere thanks to Jignaben and Parikhbhai and all the teaching and non-teaching staff of my home institute, for their co-operation during my work.

Sincere thanks to Dr. Amita Tatu and Jigar Vansola for the technical assistance. I would like to express the gratitude towards Manoj uncle, Nilambari aunty, Jeet and Punit. They have always boosted my moral and been there whenever I needed their support.

At this moment, I must acknowledge the love and trust expressed by my parents. They have always supported me in all the highs and lows and in my each decision. No amount of words will be enough to express the love and gratitude I have for them. I will never be able to repay for the unconditional love of my parents. My father has always treated me like a son. He has never tied me with gender boundaries and respected my space and has always given me the well deserved freedom. He has spent a huge amount of money for my education and comfort without any expectation. He has always been proud of me. I can't express my feelings enough for the rock solid support and administration that I got from him. All my family members have been there whenever I needed their support. I would like to express the

gratitude towards Jigarbhai, mitt and Gayatribhabhi for understanding the struggles I have been going through and always being so supportive. I would like to thank little Dhairya and Veera for filling our lives with joy and cuteness. These two little bunnies have been my stress busters in thesis writing phase. My darling daughter, Veera, has been so understanding and co-operative. She has been the source of immense strength to me. She has kept me motivated and focused while writing this thesis. I feel extremely blessed to have her in my life. I feel so lucky to have an adorable life partner, Vipul Maru, in the long journey of life. He has made my life so exciting and secure by his wonderful company and mature efforts.

Finally and most essentially my humble solicitation to the supreme power 'The Universe' for giving me a chance as a human to live and survive and being my constant companion, strong source of inspiration and my ultimate Guardian.

Date: / 08 / 2019

Vibha B. Vansola