
PHYSICAL RESEARCH LABORATORY

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Recommendation Letter for Suprabh Prakash

It is a pleasure to write this recommendation letter in support of the application of Mr. Suprabh Prakash for a Post-Doctoral position in your group.

I know Suprabh for about three years and had many interactions with him on physics issues. He is currently doing Ph.D. under the guidance of Prof. Umashanakar. He has worked mainly in exploring physics potential of long baseline neutrino experiments. In his first paper he has worked on determination of mass hierarchy using a a superbeam experiment at a baseline of 2540 km. The paper showed that such an experiment can have exceptional hierarchy sensitivity for neutrinos of energy around 3 GeV owing to the fact that at this energy and baseline the probability for the inverted hierarchical spectrum is independent of the CP phase and assumes a very low value. At the same time the probability for a normal hierarchical spectrum can attain its maximum value. This gives this baseline a very good hierarchy sensitivity. They used a narrowband superbeam to explore the potentials of hierarchy determination. This baseline also has sensitivity to the third mixing angle and CP violation. The baseline distance 2540 km is close to to BNL-HomeStake or CERN-Physalami baseline. I believe that the work by Suprabh and his collaborators have contributed in a renewed interest in these baselines.

He has recently explored the prospect of determining CP violation using by the experiments T2K and NOVA with his collaborators. It showed that for favourable values of δ_{CP} it is possible to determine this parameter at NO ν A. One of the main result of this paper is to show the synergy between T2K and No ν A. He has also worked on the potential of a Liquid Argon Detector for long baseline physics.

These papers use GLOBES software for the simulation. He has become a good expert on GLOBES and several times I have sought his suggestion on various aspects of using this software and his suggestions were always very useful. We had organized a workshop on neutrino physics at our Institute in 2011 and Suprabh gave some tutorial on GLOBES which was very lucid and demonstrated his expertize on GLOBES. His talk on these topics was selected for oral presentation in the Neutrino Oscillation Workshop, 2012. I was present in his talk. It was a clear presentation and he handled the questions adeptly.

We have recently worked together on the determination of mass hierarchy and octant using atmospheric neutrinos and a large Liquid Argon detector in view of the large value of the 1-3 mixing angle. This gave Suprabh exposure to work on atmospheric neutrinos. He has some familiarity with the atmospheric neutrino event generator Nuance.

Suprabh is intelligent and has clarity of thought. He has strong analytic and computational skills. He is thorough and critically examines various aspects in the treatment of a problem. He has already mastered the basic techniques of working in neutrino oscillation physics. Currently he is also working on more theoretical issues which is going to make his training more complete. Since he has received a good training in basic particle physics and field theory I believe that he can work in these areas also equally well with some more exposure in the coming years. He has

attended a course tutored by me on Lie Groups and Lie algebra in one of the training schools in India for graduate students and was one of the top performers in the course. He has matured very well as a competent researcher in a short time. He has a pleasing personality and can work independently as well as in a group. I strongly recommend him for a post-doctoral position. I would have been happy to offer him a post-doctoral position in our group.

Yours Sincerely

(Srubabati Goswami)