

Ian Low
Phone: (805) 893 6369
Email: ilow@northwestern.edu

November 8, 2012

Reference Letter for Shashank Shalgar

Dear Colleagues,

I am writing to support Mr. Shashank Shalgar's application for a postdoctoral position at your institutions. Shashank is a graduate student at Northwestern working primarily with Professor Andre de Gouvea in the area of neutrino physics. However, I did work on a project with him in the winter of 2008, when he took an Independent Study course with me. So I have come to know him well.

Shashank worked on neutrino in India, so he already decided to work with Professor de Gouvea when coming to Northwestern for graduate school. During his second year in graduate school, he came to ask me for a project to work on because he wanted to get exposed to different physics before diving into neutrino research full time. So I asked him to look into what information can be extracted if a MSSM Higgs boson was discovered in the diphoton channel. In particular, if the lightest CP-even Higgs boson in the MSSM is discovered at the LHC, two measurements could be made simultaneously: the Higgs mass m_h and the event rate $Bs(gg \rightarrow h \rightarrow \gamma\gamma)$. We studied to what extent the combination of these two measurements would allow us to extract parameters in the stop mass matrix, including the off-diagonal mixing term, with a focus on the MSSM golden region where the stops are light and the mixing is large. Even though both the production cross-section and the decay amplitude are not sensitive to supersymmetric parameters outside of the stop sector, the branching ratio depends on the total decay width, which is dominated by the Higgs decay to b quarks and sensitive to both the pseudo-scalar mass m_A and the supersymmetric Higgs mass μ . In the end we find m_A is an important input in extracting the stop mass parameters, while a fair estimate of the off-diagonal mixing term could be obtained without prior knowledge of μ . The paper, arXiv:0901.0266, was published in JHEP. In the course of the project, Shashank did a fine job considering he was only a second year graduate student at that time.

After our project Shashank went back to work on neutrino physics full time. Since I am not a neutrino expert, I will leave it to his other letter writers to comment on his

achievements in that area. However, I would mention that Shashank has a pleasant and easy-going personality. He has also volunteered to be the computing manager for the particle theory group at Northwestern in the last few years. I encourage you to consider his application seriously.

Please do not hesitate to email or call me at (805) 893 6369 if you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ian Low". The signature is fluid and cursive, with the first name "Ian" and the last name "Low" clearly distinguishable.

Ian Low
Assistant Professor of Physics