

SUCHISMITA SAHOO

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EDUCATION

Post Doctoral Fellow

June 2018 - December 2019

Physical Research Laboratory, Ahmedabad , India
Mentor: Prof. Namit Mahajan

PhD in Physics

April 2018

University of Hyderabad, India
Thesis: Phenomenological study of rare semileptonic B meson decays with leptoquarks.
Supervisor: Prof. Rukmani Mohanta

M.Sc in Physics

June 2013

Utkal University, Bhubaneswar, Odisha

B.Sc in Physics

June 2011

Ravenshaw University, Cuttack, Odisha

CURRENT POSITION

Assistant Professor

December 2019 - Present

Department of Physics, Central University of Karnataka,
Kadaganchi, Kalaburagi, India

ACHIEVEMENTS/AWARDS

Best Poster Award

2017

- National Conference on Physics at Small Scale And Advanced Materials-2017, University of Hyderabad, Hyderabad.

GATE

2014

- All India Rank -905.

Scholarships

2011 - 2013

- Merit scholarship provided by Institute of Mathematics and Applications, Bhubaneswar.

RESEARCH ACTIVITIES

Current Research:

- My research area includes the flavor anomalies, neutrino mass and the dark matter phenomenology. Currently, I am focusing on the model building for dark matter studies and to relate the B physics with the neutrino and dark matter sector. I am also concentrating on the connection between the issues of rare semileptonic and nonleptonic B decays in the context of various new physics. I am also computing the form factors for various rare B decays in the aim of less hadronic uncertainties.

Past Research Activities:

During my postdoc period, I have explored different new physics aspects of flavor physics and dark matter sectors. My Ph.D thesis work is on the phenomenological study of the anomalies associated with the rare semileptonic B meson decays in the context of leptoquark model. I have also concentrated on model independent phenomenological approach and the Z' model.

RESEARCH PROFILE

Inspire-HEP: <http://inspirehep.net/author/profile/Suchismita.Sahoo.1>

PUBLICATIONS

1. **S. Sahoo** and R. Mohanta, “*Scalar leptoquarks and the rare B meson decays*”, Phys.Rev. D **91**, 094019 (2015), [arXiv:1501.05193 [hep-ph]].
2. **S. Sahoo** and R. Mohanta, “*Study of the rare semileptonic decays $B_d^0 \rightarrow K^* l^+ l^-$ in scalar leptoquark model*”, Phys.Rev. D **93**, 034018 (2015), [arXiv:1507.02070 [hep-ph]].
3. **S. Sahoo** and R. Mohanta, “*Leptoquark effects on $b \rightarrow s \nu \bar{\nu}$ and $B \rightarrow K l^+ l^-$ decay processes*”, New J. Phys. **18**, 013032 (2016) [arXiv:1509.06248 [hep-ph]].
4. **S. Sahoo** and R. Mohanta, “*Lepton flavor violating B meson decays via a scalar leptoquark*”, Phys. Rev. D **93**, 114001 (2016) [arXiv:1512.04567 [hep-ph]].
5. **S. Sahoo** and R. Mohanta, “*Effects of scalar leptoquark on semileptonic Λ_b decays*”, New J.Phys. **18**, 093051 (2016) [arXiv:1607.04449 [hep-ph]].
6. **S. Sahoo**, R. Mohanta and A. Giri, “*Explaining R_K and $R_{D^{(*)}}$ anomalies with vector leptoquark*”, Phys. Rev. D **95** 035027 (2017) [arXiv:1609.04367 [hep-ph]].
7. M. Duraisamy, **S. Sahoo** and R. Mohanta, “*Rare semileptonic $B \rightarrow K(\pi) l_i^- l_j^+$ decay in vector leptoquark model*”, Phys. Rev. D **95**, 035022 (2017) [arXiv:1610.00902 [hep-ph]].
8. **S. Sahoo** and R. Mohanta, “*Study of the rare decays $B_{s,d}^* \rightarrow \mu^+ \mu^-$ ”, J. Phys. G **44**, 035001 (2017) [arXiv:1612.02543 [hep-ph]].*
9. **S. Sahoo** and R. Mohanta, “*New Physics effects in charm meson decays involving $c \rightarrow ul^+ l^- (l_i^\mp l_j^\pm)$ transitions*”, Eur. Phys. J. C **77**, 344 (2017), [arXiv:1705.02251[hep-ph]].
10. **S. Sahoo**, A. Ray and R. Mohanta, “*Model independent investigation of rare semileptonic $b \rightarrow ul\bar{\nu}_l$ decay processes*”, Phys. Rev. D **96**, 115017 (2017) [arXiv: 1711.10924].
11. **S. Sahoo** and R. Mohanta, “*Impact of vector leptoquark on $\bar{B} \rightarrow \bar{K}^* l^+ l^-$ anomalies*”, J. Phys. G **45**, 085003 (2018), [arXiv:1806.01048[hep-ph]].
12. S. Singirala, **S. Sahoo** and R. Mohanta, “*Exploring dark matter, neutrino mass and $R_{K^{(*)},\phi}$ anomalies in $L_\mu - L_\tau$ model*”, Phys. Rev. D **99**, 035042 (2019) [arXiv:1809.03213[hep-ph]].
13. A. Ray, **S. Sahoo**, and R. Mohanta, “*Probing new physics in rare heavy Λ_b decays*”, Phys. Rev. D **99**, 015015 (2019) [arXiv:1812.08314[hep-ph]].
14. **S. Sahoo**, and A. Bhol, “*Analysis of rare semileptonic B_s meson decay modes with scalar leptoquarks*”, (under review).
15. A. Ray, **S. Sahoo**, and R. Mohanta, “*Model independent analysis of $B^* \rightarrow Pl\bar{\nu}_l$ decay processes*”, Eur. Phys. J. C **79**, 670 (2019), [arXiv:1907.13586[hep-ph]].
16. S. Mishra, S. Singirala, and **S. Sahoo**, “*Scalar dark matter, Neutrino mass, Leptogenesis and rare B decays in a $U(1)_{B-L}$ model*”, [arXiv:1908.09187[hep-ph]] (under review).
17. **S. Sahoo**, and R. Mohanta “*Investigating the role of new physics in $b \rightarrow c \tau \bar{\nu}_\tau$ transitions*”, [arXiv:1910.09269[hep-ph]] (under review).

18. A. Bhol, S. R. Singh, and **S. Sahoo** “ $B_c \rightarrow D^{(*)} \tau \bar{\nu}_\tau$ processes in an effective field theory approach”, (under review).

CONFERENCE PROCEEDINGS

1. **S. Sahoo** and R. Mohanta, “*Scalar Leptoquarks and the Rare B Meson Decays*”, Springer Proc. Phys. **174**, 221-226 (2016).
2. A. Giri, R. Mohanta and **S. Sahoo**, “*Implications of lepton nonuniversality in the beauty sector*”, J. Phys. Conf. Ser, **770**, 012031 (2016) [arXiv:1610.02659 [hep-ph]].
3. R. Mohanta and **S. Sahoo**, “*Effects of Scalar Leptoquarks in $b \rightarrow s$ Transitions*”, J. Phys. Conf. Ser, **770**, 012019 (2016).
4. **S. Sahoo**, R. Mohanta and A. Giri, “*Impact of leptoquarks in semileptonic B decays*”, PoS CKM2016, **145** (2017), [arXiv:1701.06768].
5. **S. Sahoo** and R. Mohanta, “*Study of the rare decays $B_{s,d}^* \rightarrow \mu^+ \mu^-$* ”, Proceedings of XXII DAE-BRNS High Energy Physics Symposium 2016, Springer Proc. Phys. **203**, 321-324 (2018) [arXiv:1706.10026].
6. **S. Sahoo**, R. Mohanta, and A. Giri, “*Exploring lepton nonuniversality in $b \rightarrow c \bar{\nu}_l$ decay modes in the light of recent experimental data*”, Proceedings of 16th conference on Flavor Physics and CP Violation, FPCP 2018, Springer Proc. Phys. **234** (2019) 463-467.
7. A. Ray, **S. Sahoo**, and R. Mohanta, “*Probing new physics in rare heavy Λ_b decays*”, Proceedings of 16th conference on Flavor Physics and CP Violation, FPCP 2018, Springer Proc. Phys. **234** (2019) 483-487.
8. **S. Sahoo**, R. Mohanta, and A. Giri, “*Testing lepton nonuniversality in $b \rightarrow c \bar{\nu}_l$ decay modes*”, Proceedings of XXIII DAE-BRNS High Energy Physics Symposium 2018, (under review).
9. **S. Sahoo**, S. Singirala, and R. Mohanta, “*Vector-like dark matter and flavor anomalies with leptoquarks*”, Proceedings of XXIII DAE-BRNS High Energy Physics Symposium 2018, (under review).
10. A. Ray, **S. Sahoo**, and R. Mohanta, “*Probing new physics signal in rare decays of baryon*”, Proceedings of XXIII DAE-BRNS High Energy Physics Symposium 2018, (under review).
11. S. Singirala, **S. Sahoo**, and R. Mohanta, “*Majorana dark matter, neutrino mass and $R_{K^{(*)}, \phi}$ anomalies in $L_\mu - L_\tau$ model*”, Proceedings of XXIII DAE-BRNS High Energy Physics Symposium 2018, (under review).
12. M. Mahapatra, **S. Sahoo**, and A. Giri, “*Impact of nonleptonic $\bar{B}_{d,s}$ decay modes on $\bar{B}_{d,s} \rightarrow \bar{V} l^+ l^-$ processes*”, Proceedings of XXIII DAE-BRNS High Energy Physics Symposium 2018, (under review).
13. R. Mohanta, S. Singirala, and **S. Sahoo**, “*Exploring Dark Matter, Neutrino mass and Flavor anomalies in $L_\mu - L_\tau$ model*”, [arXiv: 1912.10487] (under review).
14. **S. Sahoo** and R. Mohanta, “*Analysis of $B \rightarrow D \nu_l$ decay modes*”, Proceedings of FHEP 2019, (under review).

CONFERENCE/SCHOOLS ATTENDED

FHEP 2019
University of Hyderabad, India

October 2019

Indo-US Workshop on ANOMALIES 2019
IIT Hyderabad, India

July 2019

<i>Young Physicist Meet 2019</i> PRL Ahmedabad, India	March 2019
<i>International Meeting on High Energy Physics 2019</i> IOP Bhubaneswar, India	January 2019
<i>DAE-BRNS High Energy Physics Symposium</i> IIT Madras, India	December 2018
<i>Post FPCP 2018 workshop</i> IIT Hyderabad, India	July 2018
<i>Flavor Physics and CP Violation (FPCP 2018)</i> University of Hyderabad, Hyderabad	July 2018
<i>Workshop on High Energy Physics and Phenomenology 2017 (WHEPP)</i> IISER Bhopal, India	December, 2017
<i>National Conference on Physics at Small Scale And Advanced Materials</i> University of Hyderabad, Hyderabad, India	September, 2017
<i>Summer School on Particle Physics</i> ICTP, Trieste, Italy	June 2017
<i>UGC-NRC School on Computational High Energy Physics</i> University of Hyderabad, India	March 2017
<i>DAE-BRNS High Energy Physics Symposium</i> University of Delhi, Delhi	December 2016
<i>International workshop on CKM unitary triangle (CKM 2016)</i> TIFR, Mumbai, India	December 2016
<i>Indo-US Bilateral Workshop on Understanding the Origin of the Invisible Sector: From Neutrinos to Dark Matter and Dark Energy</i> University of Hyderabad, India	November, 2016
<i>Frontier in Physics</i> University of Hyderabad, India	March 2016
<i>Workshop on High Energy Physics and Phenomenology (WHEPP)</i> Indian Institute of Technology, Kanpur, India	December 2015
<i>Recent trends in High Energy Physics</i> University of Hyderabad, India	February 2015
<i>SERC Main School on Theoretical High Energy Physics</i> BITS Pilani , Goa, India.	January 2015
<i>Frontier in Physics</i> University of Hyderabad, India	October 2014
<i>Workshop on Invisible Matters: Neutrino and Dark Matter</i> Physics Department , IIT Hyderabad.	October 2014
<i>SERC Preparatory School on Theoretical High Energy Physics</i> BITS Pilani , Hyderabad, India.	June 2014
<i>Belle Analysis Workshop</i> IIT Guwahati, India.	March 2014

CONTRIBUTED TALKS/POSTERS

FHEP 2019 Talk: Analysis of $B \rightarrow D\ell\nu_\ell$ decay modes	October 2019
Indo-US Workshop on ANOMALIES 2019 Talk: Testing role of new physics in $b \rightarrow c\tau\bar{\nu}_\ell$ transitions	July 2019
Young Physicist Meet 2019 Talk: Effects of leptoquark on flavor and dark matter sectors	March 2019
International Meeting on High Energy Physics, IOP Bhubaneswar Poster: Investigation of dark matter, neutrino mass and flavor anomalies in $L_\mu - L_\tau$ model Talk: Impact of leptoquarks on flavor anomalies	January 2019
XXIII DAE-BRNS High Energy Physics Symposium, IIT Madras Poster: Testing lepton nonuniversality in $b \rightarrow c\ell\bar{\nu}_\ell$ decay modes	December 2018
XXIII DAE-BRNS High Energy Physics Symposium, IIT Madras Talk: Vector-like dark matter and flavor anomalies with leptoquarks	December 2018
FPCP 2018, University of Hyderabad / IITH Poster: Exploring lepton nonuniversality in $b \rightarrow c\ell\bar{\nu}_\ell$ decay modes in the light of recent experimental data	July 2018
WHEPP, 2017, IISER Bhopal Talk: Explaining the R_K and $R_{D^{(*)}}$ anomalies with vector leptoquarks	December 2017
PSAM 2017, University of Hyderabad, Hyderabad Poster: Leptoquark: An excellent candidate to probe new physics in B meson decays	September, 2017
CKM 2016, TIFR, Mumbai Talk: Impact of leptoquarks in semileptonic B decays	December 2016
XXII DAE-BRNS High Energy Physics Symposium, University of Delhi Talk: Study of the rare decays $B_{s,d}^* \rightarrow \mu^+\mu^-$	December 2016
Frontier in Physics, University of Hyderabad Poster: Scalar leptoquark and the shape of new physics in rare B decays	March 2016
XXI DAE-BRNS High Energy Physics Symposium, IITG Talk: Scalar leptoquark and the rare semileptonic decays	December 2014
Frontier in Physics, University of Hyderabad Poster: Scalar leptoquark and the rare semileptonic decays	October 2014

VISIT

National Institute of Science Education and Research Talk: Leptoquark: An excellent candidate to probe new physics in flavor and dark matter sectors	January, 2019
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TEACHING EXPERIENCE

I have been involved in teaching at the home institute during my Ph.D term. Being an easy approachable person, I have always been a helping hand in mentoring junior Ph.D and M.Sc students.

Teaching Assistant University of Hyderabad, India	Winter 2016
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Teaching Assistant in M. Sc. Electromagnetic Theory-II course.
Teaching Assistant University of Hyderabad, India Spring 2016
Teaching Assistant in M. Sc. Electromagnetic Theory-II course at
Teaching Assistant University of Hyderabad, India Spring 2015
Teaching Assistant in M. Sc. Electromagnetic Theory-I course.
Teaching Assistant University of Hyderabad, India Winter 2014
Teaching Assistant in M.Sc. Lie Groups and Lie Algebra course.
Teaching Assistant University of Hyderabad, India Spring 2014
Teaching Assistant in Ph.D. Quantum Mechanics course.

COMPUTER SKILLS

Platform: Linux, Windows

Programming fortran, C

- **Toolkit:**

Mathematica - Modern technical computing system spanning most areas of technical computing,
ROOT - An Object-Oriented Data Analysis Framework,

LANGUAGE

Odia: Fluent (Mothertongue)

Hindi: Fluent

Eglish: Fluent

German: Learned Level-I