

CURRICULUM VITAE

Dr. Waseem Ahmad Bhat

Department of Physics, University of Kashmir, Srinagar - 190006, Jammu and Kashmir, INDIA

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Area of Specialization: Experimental high-energy physics, Quark Gluon Plasma (QGP)

EDUCATION

Doctor of Philosophy (Ph. D.), University of Kashmir, Jammu and Kashmir, India

Graduation: January 2025

Major: Experimental High Energy Physics

Relevant Coursework: High Energy Physics, Computational Methods and Programming, and Research Methodology

Thesis title: Probing deconfinement phase transition with low mass vector mesons and charged hadrons at FAIR energies using UrQMD and HSD model

Studied collective phenomena and particle production in heavy-ion collisions, focusing on low mass vector mesons and charged hadrons. Utilized the Parton-Hadron-String Dynamics (PHSD), and Ultra-relativistic Quantum Molecular Dynamics (UrQMD) models for collision simulations. Conducted extensive data generation using the GSI cluster computing facility and contributed to CBM detector performance studies with GEANT3.

Master of Science (M. Sc.) University of Kashmir, Srinagar, India

Graduation: 2016

Major: Physics

Grade Point Average: 7.62

Relevant Coursework: Quantum Mechanics, Statistical Mechanics, Classical Mechanics, Electrodynamics, Quantum Field Theory, Nano Physics, Solid State Physics, Atomic and Molecular Physics, Nuclear and Particle Physics, Computational Methods and Programming, Neutrino Physics, Bose Einstein Condensate (BEC)

Bachelor of Science (B. Sc.) University of Kashmir, Jammu and Kashmir, India

Major: Physics, Mathematics, Chemistry

Graduation: January 2013

Percentage: 60.61%

Relevant Coursework: Quantum Mechanics, Classical Mechanics, Solid State Physics, Digital and Analog Electronics, Atomic and Molecular Physics, C++ programming, Statistical Mechanics, Mathematics

TECHNICAL SKILLS

Programming Languages and Frameworks:

C++, ROOT, GEANT3, LaTeX

Event Generators:

UrQMD and PHSD

Languages

English

ACADEMIC ACHIEVEMENTS

- State Eligibility Test (SET)**, University of Kashmir, Srinagar 2018
I have qualified for the State Eligibility Test in the subject of Physics. It is conducted by the University of Kashmir, Srinagar, India.
- Qualified IIT JAM in Physics (AIR 346)** Conducted by the IIT Kanpur. 2014

RESEARCH AFFILIATIONS/COLLABORATIONS

Member, CBM Collaboration 2019- present

The Compressed Baryonic Matter (CBM) Collaboration is an association of institutes to construct, maintain, and operate the CBM detector at the Facility for Antiproton and Ion Research (FAIR). Upon completion of the detector construction, the Collaboration will collect and analyze data and publish the results in scientific journals.

<https://www.cbm.gsi.de>

PUBLICATIONS

1. Elliptic flow of inclusive charged hadrons in Au+Au collisions at $E_{\text{lab}} = 35$ A GeV using the PHSD model, **B. Waseem**, M. Farooq, V. Bairathi, B. Towseef, S. Kabana, and S. Ahmad, *J. Phys. G: Nucl. Part. Phys.* **50**, 125106 (2023).
As the lead author for this paper, I contributed to data generation, analysis, and manuscript drafting. Specifically, I generated 50 million Au+Au collision events at different beam energies using the PHSD model on the GSI cluster computing facility.
2. Collision energy dependence of elliptic flow of identified hadrons in heavy-ion collisions using the PHSD model, B. Towseef, M. Farooq, V. Bairathi, **B. Waseem**, S. Kabana, and S. Ahmad, *Phys. Lett. B* **859**, 139103 (2024).
As the co-author for this paper, I contributed to data generation and part of the analysis.
3. Elliptic flow of identified hadrons in Au+Au collisions at $E_{\text{lab}} = 35$ A GeV using the PHSD model, B. Towseef, M. Farooq, V. Bairathi, **B. Waseem**, S. Kabana, and S. Ahmad, *Eur. Phys. J. C* **83**, 649 (2023).
As the co-author for this paper, I contributed to data generation and part of the analysis.

PROCEEDINGS

1. Elliptic flow of charged hadrons in Au+Au collisions using the PHSD model, **B. Waseem**, M. Farooq, S. Ahmad, B. Towseef and Arshad Ahmad, Proceedings of the DAE Symp. on Nucl. Phys. 66, p. 1038 (2022), **ISBN: 978-81-959225-1-2**
2. Performance study of MUCH detector for low mass vector mesons at 8 A GeV, **B. Waseem**, M. Farooq, S. Ahmad, B. Towseef and Arshad Ahmad, Proceedings of the DAE Symp. on Nucl. Phys. 65, p. 736 (2021), **ISBN: 978-81-959225-1-2**
3. ϕ meson yield using PHSD model at FAIR energies, **B. Waseem**, M. Farooq, S. Ahmad, B. Towseef and Arshad Ahmad, Proceedings of the DAE Symp. on Nucl. Phys. 65, p. 686 (2021) **ISBN: 978-81-959225-1-2**
4. Azimuthal anisotropy of identified hadrons in Au+Au collisions at $E_{\text{lab}} = 25$ A GeV using the PHSD model, B. Towseef, M. Farooq, S. Ahmad, **B. Waseem**, Arshad Ahmad, Proceedings of the DAE Symp. on Nucl. Phys. 66, p. 1036 (2022), **ISBN: 978-81-959225-1-2**

5. Production of multi-strange hyperons at FAIR energies, B. Towseef, M. Farooq S. Ahmad, **B. Waseem**, Arshad Ahmad, Proceedings of the DAE Symp. on Nucl. Phys. 65, p. 684 (2021), **ISBN: 978-81-959225-1-2**
6. Elliptic and Triangular flow studies of ϕ meson in Nucleus-Nucleus Collisions at $E_{lab} = 10$ A GeV and 30 A GeV, Arshad Ahmad, M. Farooq, S. Ahmad, B. Towseef, and **B. Waseem**, Proceedings of the DAE Symp. on Nucl. Phys. 66, p. 746 (2021), **ISBN: 978-81-959225-1-2**

BOOK CHAPTERS/REPORTS

1. Elliptic flow of inclusive charged hadrons at $E_{lab} = 25$ A GeV using the HSD model, **B. Waseem**, M. Farooq, B. Towseef *et al.*, CBM Progress Report 2022, p. 192, FAIR-GSI, Darmstadt, Germany, **ISBN: 978-3-9822127-1-5**
2. Study of ϕ meson using HSD and PHSD model, **B. Waseem**, M. Farooq, B. Towseef *et al.*, CBM Progress Report 2021, p. 221, FAIR-GSI, Darmstadt, Germany, **ISBN: 978-3-9822127-0-8**
3. Reconstruction of low mass vector mesons by MUCH at 8 A GeV, **B. Waseem**, M. Farooq, B. Towseef *et al.*, CBM Progress Report 2020, p. 92, FAIR-GSI, Darmstadt, Germany, **ISBN: 978-3-9815227-9-2**
4. Anisotropic flow measurements of identified hadrons in Au+Au collisions at $E_{lab} = 25$ A GeV using the HSD model, B. Towseef, M. Farooq. **B. Waseem et al.**, CBM Progress Report 2022, p. 189, FAIR-GSI, Darmstadt, Germany, **ISBN: 978-3-9822127-1-5**
5. Energy dependence of hyperon production in Au+Au collisions at FAIR energies, B. Towseef, M. Farooq, **B. Waseem et al.**, CBM Progress Report 2021, p. 220, FAIR-GSI, Darmstadt, Germany, **ISBN: 978-3-9822127-0-8**
6. Production of Ω^- , Ξ^- , Λ^0 at FAIR energies, B. Towseef, M. Farooq, **B. Waseem et al.**, CBM Progress Report 2020, p. 188, FAIR-GSI, Darmstadt, Germany, **ISBN: 978-3-9815227-9-2**
7. Energy dependence of ϕ meson yield at FAIR energies. A. Arshad, M. Farooq Mir, S. Ahmad, **B. Waseem**, and B. Towseef, CBM Progress Report 2020, p. 187, FAIR-GSI, Darmstadt, Germany, **ISBN: 978-3-9815227-9-2**

CONFERENCES/WORKSHOPS/SCHOOLS

1. Presented “Elliptic flow of inclusive charged hadrons in Au+Au collisions using the PHSD model”, in XII International Conference on New Frontiers in Physics, held in Orthodox Academy of Crete, Greece from 10-23 July 2023.
2. Participated in Synergistic Training Program Utilizing The Scientific And Technological Infrastructure (STUTI), organized by the Department of Physics, University of Kashmir, Srinagar in collaboration with Shivaji University, Kolhapur, Maharashtra, India from May 23 – 29, 2022.
3. Participated and presented “Performance study of MUCH detector for low mass vector mesons at 8 A GeV” at the 65th DAE-BRNS Symposium on Nuclear Physics (SNP2021) on December 1-5, 2021.
4. Participated and presented “ ϕ meson yield using PHSD model at FAIR energies” at the 65th DAE-BRNS Symposium on Nuclear Physics (SNP2021) on December 1-5, 2021.
5. Attended the orientation program with the theme, “Nuclear Isomerism: Commemorating the Centenary of Discovery” on November 30, 2021, in the 65th DAE-BRNS Symposium on Nuclear Physics (SNP2021).
6. Participated in a Two-day introductory workshop on “Astronomy and Astrophysics” on 18-9 December 2021, organized by the Department of Physics, University of Kashmir, Srinagar, India.

7. Participated and presented in the 27th International Conference of International Academy of Physical Sciences (XXVII), on “FRONTIERS IN PHYSICS” jointly organized by the Department of Physics, Islamic University of Science and Technology (IUST), Awantipora, India, and the Department of Physics, University of Kashmir (UOK), Srinagar, India.
8. Attended the 2020 Inverted CERN School of Computing online, organized by CERN from September 28th to October 2nd, 2020(Qualified the final evaluation test).
9. Participated in the TEQIP-III sponsored one-week short-term course on “Emerging Fields in High Energy Physics” from 15-19 July 2019, organized by the Department of Physics, Dr. B. R. Ambedkar National Institute of Technology, Jalandhar, Punjab, India.

TEACHING EXPERIENCE

Teaching Assistant in Physics, Central University of Kashmir, Jammu and Kashmir, India

Nov. 2018 to Jan 2019

I have taught the course of Modern Physics to B.Sc IV semester students and the course of Advanced Quantum Mechanics II to M.Sc IV Semester Students.

Assistant Professor (Contractual) in Physics, Islamic University of Science and Technology (IUST) Kashmir, Jammu and Kashmir, India.

Feb. 2026 - present