

Dr. Sulagna Dutta

Assistant Professor
Department of Physics
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Academic Qualification (Undergraduate Onwards)

- 2009 Received Ph.D from Jadavpur University for the thesis entitled “**Theoretical study of the effect of dynamically induced coherence and spontaneously generated coherence on nonlinear processes**”
- 2001 Received M. Sc. (Master of Science) in Physics from University of Calcutta, West Bengal, India.
- 1998 Received B.Sc. (Honors) in Physics from University of Calcutta, West Bengal, India.

Current Position and Working area:

- 2015- Till date: Working as an Assistant Professor in the Department of Physics, Mathabhanga College, Coochbehar, West Bengal Pin-736146 (www.mtbcollege.ac.in).
- 2011- 2015: Working as an Assistant Professor in the Department of Physics, Adamas Institute of Technology, Barasat, Kolkata
- 2009-2011: Research Associate in the Spectroscopy Department, Indian Association for the cultivation of Science, Kolkata

Awards and Honors:

- Qualified in **State Level Eligibility Test (SLET 2003)** for selection of Lecturers, conducted by West Bengal College Service Commission, West Bengal, India.
- Qualified **Graduate Aptitude Test for Engineering (GATE 2003)**, conducted by Indian IIT
- Received **DST Women Scientist –A (WOS-A)** fellowship in 2011
- Received Outstanding Paper Award in 2nd **Regional Science and Technology Congress, 2017**
- Presented paper in International Conference on **Advanced Materials and Processes for Defence Applications (ADMAT-2019)**, 2019, Organised by Defence Metallurgical Research Laboratory, Hyderabad, India

Publications in Journals:

1. **“Study of Amplification without Inversion in H₂ molecule: Effect of homogeneous and inhomogeneous broadening in three level \square system considering bidirectional pumping”** – Sulagna Dutta and K.Rai Dastidar, International Journal of Theoretical Physics, Group Theory and Nonlinear Optics; Vol. **12**, No. 1, Page 43 (2006).
2. **“Amplification without inversion and absorption with inversion in H₂ molecule: A dressed-state picture of a coherently coupled three level \square system”** - Sulagna Dutta and K.Rai Dastidar, International Journal of Theoretical Physics, Group Theory and Nonlinear Optics; Vol. **12**, No. 1, Page 65 (2006).
3. **“Control of amplification without inversion in H₂ and LiH molecules: Dependence on relative magnitude of probe and coherent field Rabi frequencies in three-level $\square\square$ system.”** - Sulagna Dutta and K.Rai Dastidar, Pramana-J.of Phys. Vol. **67**, No. 6, 1099 (2006).
4. **“Combined effect of spontaneously generated coherence and dynamically induced coherence in a three-level closed \square system”** - Sulagna Dutta and K.Rai Dastidar, J. Phys. B: At. Mol. Opt. Phys. **39**, 4525 (2006).
5. **“Control over group velocity in a three-level closed \square system via spontaneously generated coherence and dynamically induced coherence”**- Sulagna Dutta and K. Rai Dastidar, J. Phys. B: At. Mol. Opt. Phys. **40**, 4287 (2007)
6. **“Control of probe response and dispersion in a three level closed \square system : Interplay between Spontaneously Generated Coherence and Dynamically Induced Coherence”**- Sulagna Dutta and K. Rai Dastidar, Journal of Physics: Conference Series, **80**, 012030 (2007)

7. **“Broadening of EIT window by incoherent pumping in three level \square system: Effect of homogeneous and inhomogeneous broadening”**- K. Rai Dastidar and Sulagna Dutta, Euro. Phys. Lett. 82, 54003 (2008)
8. **“A New Way of Broadening the EIT Window: control over Subluminal Group velocity”** - K. Rai Dastidar and Sulagna Dutta, Journal of Physics: Conference Series, 185, 012036 (2009)
9. **“Amplification Without Population Inversion”**- Sulagna Dutta and K. Rai Dastidar, Nonlinear Optics and Quantum Optics, 41, pp. 287–304 (2010)
10. **“Control over group velocity in a three level closed Ladder system with Spontaneously Generated Coherence”**- Sulagna Dutta and K. Rai Dastidar, International Journal of Theoretical Physics, Group Theory and Nonlinear Optics; Vol. 14, No. 3, Page 1 (2010).
11. **“High refractive index without absorption via spontaneously generated coherence in a three level Ladder system”**- Sulagna Dutta Phys. Scr. 82, 015402 (2010)
12. **“Effects of Spontaneously Generated Coherence and Dynamically Induced Coherence on the susceptibility and group index of a three level closed \square system”** – Sulagna Dutta, Nonlinear Optics and Quantum Optics, 41, pp. 329–341 (2010)
13. **“Incoherent pump rate: An optical tool to control the probe response and dispersion in a three level \square system in presence of spontaneously generated coherence”** – Sulagna Dutta, Phys. Scr. 83, 015401 (2011)
14. **Realization of negative refractive index in three level $\square\square$ system via Spontaneously generated coherence**, S. Dutta and K. Rai Dastidar, J. Phys. B: At. Mol. Opt. Phys. 43, 215503 (2010)
15. **Switching from superluminal to subluminal light propagation in the negative refractive index region of a three-level \square system in presence of spontaneously generated coherence**, S. Dutta and K. Rai Dastidar, Asian J. of Physics, Vol 20, 203 (2011)
16. **Study of group velocity in the negative refractive index region in three level closed \square system via spontaneously generated coherence**, S. Dutta and K. Rai Dastidar, Molecular Physics, Vol. 110, 431 (2012)

Publication in book

1. **Subluminal and Superluminal Light Propagation in a three-level closed \square system: Effects of Spontaneously generated coherence and dynamically induced coherence**, K. Rai dastidar and S. Dutta, Advances in Atomic, Molecular and Optical Science, Editor E. Krishnakumar, Allied Publishers Pvt. Ltd., 2008

List of publications in book of abstract:

1. **Effect of replenishment of the ground state on amplification without population inversion in molecules**, K Rai Dastidar and S. Dutta , XV National Conference Atomic and Molecular Physics, Ahmedabad, India, Dec 20th -23th , 2004
2. **Ab-initio on lasing without inversion in H₂ molecule in three-level Λ system : Effect of replenishment**, S Dutta and K. Rai Dastidar , XXIV International Conference on Photonic, Electronic and Atomic Collisions, Rosario, Argentina, July 20th – 26th, 2005
3. **Amplification without Inversion and Absorption with Inversion in H₂ molecule: A dressed-state picture of coherently coupled Λ system**, Topical Conference on Atomic, Molecular and Optical Physics, Indian Association for the Cultivation of Science, Calcutta, December 13 - 15, 2005
4. **Study of Amplification without inversion in H₂ molecule: Effect of homogeneous and inhomogeneous broadening in three level Λ system considering bidirectional pumping**, S. Dutta and K. Rai Dastidar, National Symposium on Spectroscopy and its applications, Indian Association for the Cultivation of Science, Calcutta, January 18-20, 2006
5. **Effects of Spontaneously Generated Coherence and Dynamically Induced Coherence in the closed Λ system** - S. Dutta and K. Rai Dastidar, 7th Asian International Seminar on Atomic and Molecular Physics , 4th to 7th December, 2006
6. **Effects of Spontaneously Generated Coherence in the closed ladder system** – S. Dutta and K. Rai Dastidar, XVI National Conference Atomic and Molecular Physics, Mumbai, India, Jan 8th -11th , 2007
7. **Control of probe response and dispersion in a three-level closed L system: Interplay between spontaneously generated coherence and dynamically generated coherence** – S. Dutta and K. Rai Dastidar, IX European Conference Atomic and Molecular Physics, Heraklion, Crete, Greece, May 6th -11th , 2007
8. **Control over group velocity in a three level closed Λ system via spontaneously generated coherence and dynamically generated coherence**, S. Dutta and K Rai Dastidar, XXV International Conference on Photonic, Electronic and Atomic Collisions, Freiberg, Germany, July 25th to 31st, 2007
9. **Realization of EIT in LiH molecule: Effect of Spontaneously Generated Coherence and Dynamically Induced Coherence** – S Dutta and K. Rai Dastidar, Topical Conference on Atomic and Molecular Physics, Vallabh Vidyanagar, Gujarat, India, Jan 3rd-5th, 2008
10. **Control over group velocity in a three level closed Λ system: Effect of spontaneously generated coherence and dynamically generated**, S. Dutta and K. Rai Dastidar, Workshop on Coherent Control of Optical Phenomena, IIT Kanpur, India, July 9-10, 2007
11. **Control over broadening of EIT Window by controlling the interference of coherences in molecules: Role of incoherent pumping in presence of homogeneous and inhomogeneous decay**, K. Rai Dastidar and S. Dutta, The 8th Asian International Seminar on Atomic and Molecular Physics, Perth, Australia, Nov 24th-28th, 2008
12. **A new approach for broadening of EIT window by incoherent pumping in a three-level Λ system**, S. Dutta and K. Rai Dastidar, , XVII National Conference Atomic and Molecular Physics, Delhi, India, Feb 10th -13th , 2009
13. **A New Way of Broadening EIT Window: control over Subluminal Group**

Velocity, S. Dutta and K. Rai Dastidar, Topical Conference on Atomic, Molecular and Optical Physics, 3-6 March, 2010, Raja Ramanna Centre For Advanced Technology, Indore – 45201.

14. **Realization of negative refractive index in three level Λ system via Spontaneously generated coherence**, S. Dutta and K. Rai Dastidar, Recent Trends in Research on Atomic, Molecular and Optical (AMO) Physics, 17 March, 2010, Indian Association for the Cultivation of Science, Calcutta

15. **“Realization of negative refractive index in a three-level Λ system via spontaneously generated coherence”** – S. Dutta and K. Rai Dastidar, DAE- BRNS Symposium on Atomic, Molecular and Optical Physics, Feb. 22-25, 2011, Karnatak University, Dharwad, India

Participation in Orientation Programme/ Refresher Course:

- 30th Orientation Programme : **Organiser department & Institution:** North Bengal University & UGC-HRDC
- Refresher Course on Disaster Management: **Organiser department & Institution:** North Bengal University & UGC-HRDC

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