Memorandum of Understanding

For

IRNSS Navigation Receiver Field Trial and Data Collection

Between

Space Applications Centre

Indian Space Research Organization

Department of Space, Government of India

Ahmedabad - 380015

And

Tripura University

(A Central University)

Suryamaninagar, Tripura West, Pin-799022

This MOU is entered into on 15th day of September, 2016

BETWEEN

Space Applications Centre, Jodhpur Tekra, Ambawadi Vistar P.O., Ahmedabad, 380015, a centre of Indian Space Research Organization, Department of Space, Government Of India (hereinafter called "SAC" which expression shall where the context so admits include its successors and permitted assignees) of the one part,

AND

Department of physics, Tripura University (a Central University) having address at-P.O. Suryamaninagar, PIN-799022, P. S Amtali, District: West Tripura, State - Tripura, Country - India; established under the Tripura University Act, 2006 being represented by its REGISTRAR or Registrar designated (being empowered to do so).

Hereinafter in short called as "TU-Physics" (which expression shall unless it be repugnant to the context or meaning thereof mean and include its legal representatives, successors, administrators and permitted assignees) of the Other Part.

Recurring

DBT-NER/Agri/29/2015 (Group-6)
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY
(NER BPMC)
****

Block-2, 7th Floor,
CGO Complex, Lodhi Road
New Delhi - 110003
Dated: 14/05/2019

ORDER

In continuation of this department's sanction order of even number dated 19/10/2016, sanction of the President of India is hereby accorded under Rule 18 of the Delegation of Financial Powers Rules, 1978 for the release of third year grant of ₹ **29.11 lakhs (Rupees Twenty Nine lakhs and Eleven Thousand only)** for the **'DBT's Program for the NE'** titled **"Microbial role in yield management of scented rice of North East India"** by Dr. N. C. Talukdar, Institute of Advanced Study in Science and Technology, Guwahati, Assam; Dr. Debananda S. Ningthoujam, Manipur University, Imphal, Manipur; Dr. Piyush Pandey, Assam University, Silchar, Assam; Dr. B. N. Singh, National Botanical Research Institute, Lucknow; Dr. Ajay Krishna Saha, Tripura University, Agartala, Tripura and Prof. N. k. Dubey, Banaras Hindu University, Varanasi, Utter Pradesh, as per the details given below:

a. The Registrar, Manipur University, Imphal, Manipur

(₹ in lakhs)

Sl. No.	Items	3rd Year
Recurring		
1.	Manpower	4.28
2.	Consumables	0.00
3.	Travel	0.00
4.	Contingency	0.00
5.	Overhead	0.32
	SUB TOTAL	**4.60**

(Rupees Four lakhs and Sixty Thousand only)

*Interest earned of Rs. 0.11 lakhs is re-appropriated to Overhead.
**Excess Balance of Rs. 0.57 lakhs under consumables head is re-appropriated to overhead.

b. The Registrar, Tripura University, Tripura.

(₹ in lakhs)

Sl. No.	Items	3rd Year
Recurring		
1.	Manpower	4.10
2.	Consumables	3.00
3.	Travel	0.40
4.	Contingency	0.50
5.	Overhead	0.48
	SUB TOTAL	8.48

(Rupees Eight lakhs and Forty Eight Thousand only)

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BIOTECH CONSORTIUM INDIA LIMITED

BCIL

5th Floor, Anuvrat Bhawan, 210, Deen Dayal Upadhyaya Marg, New Delhi-110002
CIN: U73100DL1990PLC041486 **Tel :** 2321 9064 - 67 **Fax :** 011- 2321 9063
Email : info.bcil@nic.in **Website :** http://www.bcil.nic.in

BCIL/NER-BPMC/2016/

October 27, 2016

The Registrar,
Tripura University,
Suryamaninagar,
Tripura- 799022,
Agartala

Dear Sir/Madam,

Sub.: Release of grant to the implementing agency for the project entitled "Microbial roles in yield management of scented rice of north east India" under DBT's Twinning Program for the NE

As you may be kindly aware, the Department of Biotechnology (DBT), Government of India, has setup a North Eastern Region-Biotechnology Programme Management Cell (NER-BPMC) for promotion of Biotechnology in the North Eastern Region of India through Biotech Consortium India Limited (BCIL), a company promoted by the Department of Biotechnology.

We are happy to inform you that the above proposal submitted by your organization has been sanctioned by DBT. Please find enclosed herewith a copy of the Sanction Order No. DBT-NER/AGRI/29/2015 (Group-6) dated October 19, 2016 of the DBT along with terms and conditions of the grant, format of UC/SE, format of asset acquired, format of memorandum of agreement, etc.

Our Accounts Division has transferred an amount of Rs. 28.01 lakhs as first year release towards implementation of the above project at your organization as per the following bank details:

Account Holder's Name: Registrar, Tripura University
Bank and branch: State Bank of India, Tripura University Campus
Account No.: 30371209938
IFSC code: SBIN0010495

We request you to please send the signed Memorandum of Agreement (MOA) which has to be executed on Rs. 100/- non-judicial stamp paper as per the format enclosed. You are also requested to send a signed copy of the terms and conditions of the grant. These signed documents may please be sent to **Dr. T. Madhan Mohan, Adviser, Department of Biotechnology (DBT), Block No. 2, 7th Floor, CGO Complex, Lodi Road, New Delhi-110003** within a month's time from the date of release of funds to your organization, latest by November 26, 2016.

Kindly acknowledge the receipt.

Thanking you,

Yours faithfully

(Vinod Kumar)
Manager

CC for kind information to:

1) The Vice-Chancellor, Tripura University, Suryamaninagar, Tripura- 799022, Agartala.
2) Dr. Ajay Krishna Saha, Professor, Department of Botany, Tripura University, Suryamaninagar, Tripura-799022, Agartala.
3) Dr. Shaon Ray Chaudhuri, Associate Professor, Department of Microbiology, Tripura University, Suryamaninagar, Tripura- 799022, Agartala.

1st Draft

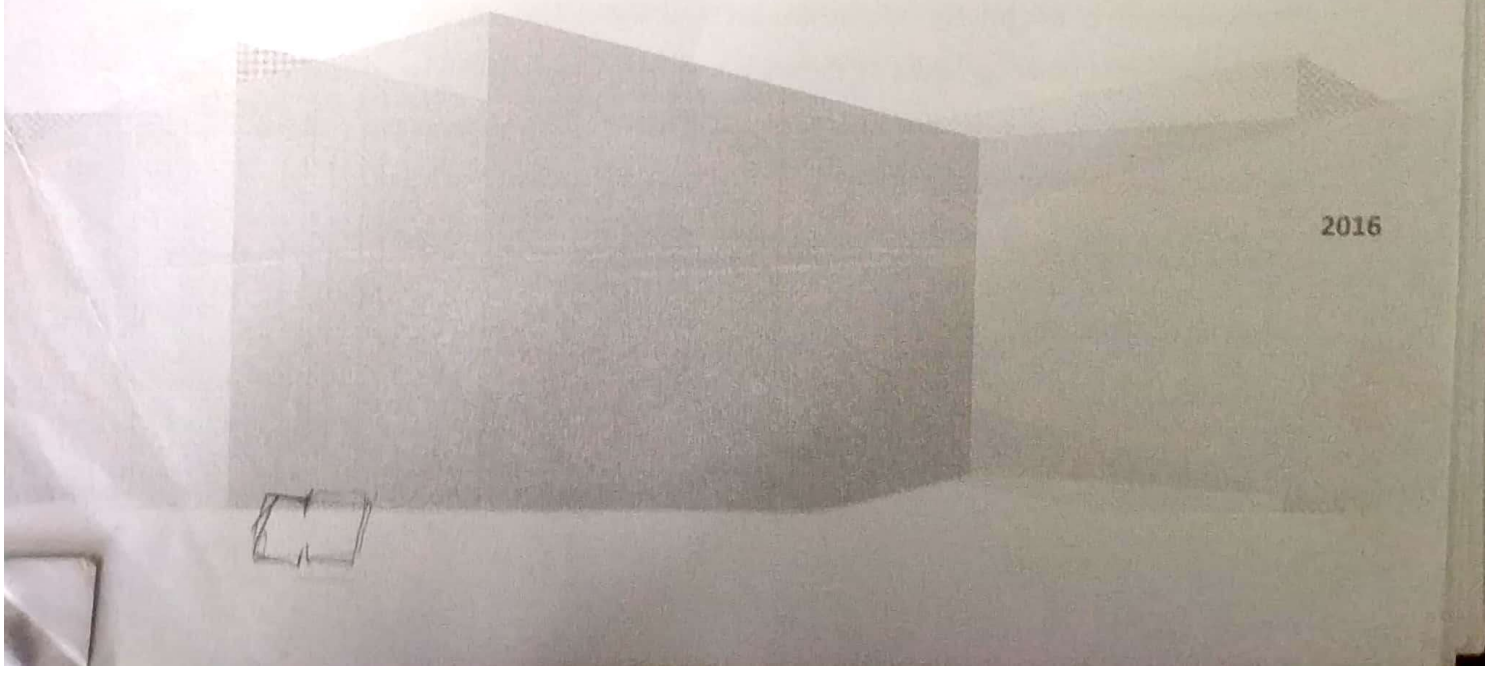
Socio- Economic Impact Assessment of Bamboo Farming in West Tripura

A Case Study of Hezamara and Mohanpur Blocks

A Study Report by Dr. Sharmila Chhotaray, Manusri Jamatia, Chayanika Paul, Anasmita Ghosh, Lalnundika Darlong & Bibaljoy Reang

Department of Sociology, Tripura University

(A Central University)



2016

1. **MOA between DBT and Tripura University for the project "Microbial enzyme based natural fiber (Ramie) finishing: an eco-friendly approach"**

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

त्रिपुरा TRIPURA 268754

MEMORANDUM OF AGREEMENT

This MEMORANDUM OF AGREEMENT is made on this **8th day of November, Two thousand and Sixteen** BY AND BETWEEN President of India, acting through, The Advisor, Department of Biotechnology, Ministry of Science and Technology, Government of India, New Delhi, hereinafter referred to as the 'DBT' (which expression unless excluded by or repugnant to the subject shall mean and include its successor-in-office and assigns) of the ONE PART;

AND

Tripura University **(Tripura University Act 2006)**, having its registered office in/at **Tripura University, Permanent campus, Suryamaninagar-799022, Agartala, Tripura, West, India**- hereinafter referred to as **Tripura University** (which expression shall where the context so admits include its successors and permitted assigns) of the OTHER PART;

WHEREAS DBT being desirous of promoting research in **Agricultural Science under the Twinning programme for the NE** decided to support a project submitted by **Tripura University** for the attainment of the objectives, hereinafter described in the Annexure I annexed hereto;

Shaon Ray Chaudhuri 8/11/16

8/11/16

This Memorandum of Agreement (MoA) defines the role and responsibilities of the participating agencies, monitoring and other matters related to the **"Microbial enzyme based natural fiber (Ramie) finishing: an ecofriendly approach"**

NOW THE PARTIES HERETO AGREE AS FOLLOWS:-

1.0 . ROLE OF DEPARTMENT OF BIOTECHNOLOGY, NEW DELHI

To provide funds to the extent of **`63.60 Lakhs** over a period of **three** years from the date of sanction of the project, to **Tripura University** for undertaking activities as detailed in Annexure I. Details of the funds to be provided are given in Annexure II.

2.0. ROLE OF TRIPURA UNIVERSITY (Institute/NGO)

2.1. To provide their contribution of **` Nil** for **three** years from date of sanction of the project as detailed in Annexure – II. (if a jointly supported project)

2.2. To provide existing facilities as mentioned in the project document.

2.3. To be responsible for accomplishing objectives identified and activities listed.

2.4. To allow the Scientists authorized by DBT to work with the Research & Development team of the center in all stages of process development and production.

2.5. To recruit all scientific and non-scientific staff as sanctioned by DBT.

2.6. To prepare and submit all periodical reports and other documents that would be required by DBT.

2.7. To maintain a separate audit head of account for the grants received from DBT for the project.

2.8. To submit an annual audited statement of expenditure incurred under the project.

2.9. To ensure effective utilization of the grant given by DBT for the purpose for which it was granted and to ensure timely progress of project work.

2.10. The manpower, both scientific and non-scientific, recruited shall be purely on contractual terms & conditions such that the contract for engagement of the manpower shall run concurrently with the said project period only.

3.0 DURATION OF PROJECT

3.1 Duration of project shall be three years from the date the Project has been sanctioned by DBT.

4.0 RIGHTS OF OWNERSHIP/TECHNOLOGY TRANSFER AND UTILIZATION

Chaon Ray Chaudhuri

8/11/16

BIOTECH CONSORTIUM INDIA LIMITED

BCIL

5th Floor, Anuvrat Bhawan, 210, Deen Dayal Upadhyaya Marg, New Delhi-110002
CIN: U73100DL1990PLC041486 **Tel :** 2321 9064 - 67 **Fax :** 011- 2321 9063
Email : info.bcil@nic.in **Website :** http://www.bcil.nic.in

BCIL/NER-BPMC/2017/164 March 14, 2017

The Registrar,
Tripura University,
Suryamaninagar,
Tripura- 799022,
Agartala

Dear Sir/Madam,

Sub.: Release of grant to the implementing agency for the project entitled "Screening of the anti leukemic and anti oxidant potential of medicinal plants of Tripura: leading to chemical identification of the lead molecules" under DBT's Program for the NE

As you may be kindly aware, the Department of Biotechnology (DBT), Government of India, has setup a North Eastern Region-Biotechnology Programme Management Cell (NER-BPMC) for promotion of Biotechnology in the North Eastern Region of India through Biotech Consortium India Limited (BCIL), a company promoted by the Department of Biotechnology.

We are happy to inform you that the above proposal submitted by your organization has been sanctioned by DBT. Please find enclosed herewith a copy of the Sanction Order No. BT/PR15965/NER/95/37/2015 dated January 20, 2017 of the DBT along with terms and conditions of the grant, format of UC/SE, format of asset acquired, format of memorandum of agreement, etc.

Our Accounts Division has transferred an amount of Rs. 15.20 lakhs as first year release towards implementation of the above project at your organization as per the following bank details:

Account Holder's Name: Registrar, Tripura University
Bank and branch: State Bank of India, Tripura University Campus
Account No.: 30371209938
IFSC code: SBIN0010495

We request you to please send the signed Memorandum of Agreement (MOA) which has to be executed on Rs. 100/- non-judicial stamp paper as per the format enclosed. You are also requested to send a signed copy of the terms and conditions of the grant. These signed documents may please be sent to **Dr. T. Madhan Mohan, Adviser, Department of Biotechnology (DBT), Block No. 2, 7th Floor, CGO Complex, Lodi Road, New Delhi-110003** within a month's time from the date of release of funds to your organization, latest by April 14, 2017.

Kindly acknowledge the receipt.

Thanking you,

Yours faithfully

(Vinod Kumar)
Manager

CC for kind information to:

1) The Vice-Chancellor, Tripura University, Suryamaninagar-799022, Tripura

2) Prof. Badal Kumar Datta, Professor, Dept. of Botany, Tripura University, Suryamaninagar-799022, Tripura

No. BT/PR12956/NDB/39/504/2015
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY

Block 2, (6-8th Floors)
CGO Complex, Lodhi Road,
New Delhi- 110 003
Date: 27.02.2017

RELEASE ORDER

In continuation of this Department's sanction order of even number dated 27.02.2017 sanction of the President is hereby accorded, under Rule18 of the Delegation of Financial Powers Rule, 1978, for the release of Rs. **24088080.00** (Rupees Two Crores Fourty Lakhs Eighty Eight Thousand and Eighty Only) being the first year release for the project entitled **"Establishment of a Culture Collection Centre in North East Region of India Phase II"**, being implemented by:

1. Dr. Amit Kumar Rai, Regional Centre of Institute of Bioresources and Sustainable Development, 5th Mile, Metro Point,National Highway 31A, Tadong,, Gangtok - 737102, Sikkim
2. Dr. Debajit Thakur, Institute of Advanced Study In Science & Technology, Paschim Boragaon, Garchuk,, Guwahati Assam - 781035, Assam
3. Dr. Debananda S Ningthoujam, Manipur University, Indo Myanmar Road, NH-39, Koirou Village, Imphal - 795003, Manipur
4. Prof. Dinabandhu Sahoo, Institute of Bioresources And Sustainable Development, Takyelpat Institutional Area, Imphal - 795001, Manipur
5. Dr. Panna Das, Tripura University, Suryamaninagar, Agartala - 799022, Tripura
6. Dr. S Singh Sureshkumar, North Eastern Regional Institute of Science And Technology, New Degree Block,, Itanagar - 791109, Arunachal Pradesh
7. Dr. Santa Ram Joshi, North-Eastern Hill University, Shillong, Mawkynroh, Umshing,, Shillong - 793022, Meghalaya
8. Dr. Shaon Chaudhuri Ray, Tripura University, Suryamaninagar, Agartala - 799022, Tripura
9. Dr. Talijungla , Nagaland University, Lumami,, Zunheboto - 798627, Nagaland

Research Centre for Astronomy and Earth Sciences
Geodetic and Geophysical Institute
H-9400 Sopron, Csatkai E. u. 6-8. Tel.: (+36) 99 508-340 www.csfk.mta.hu

Tripura University, India

To Whom it may concern,

I kindly inform you that Dr. Anirban Guha's name has become known for me since his first visit as post-doc at Professor Earle Williams at MIT, USA in 2012-2013. In those years my cooperation with Professor Williams had already dated back almost for two decades. In this way we have got with Dr. Guha on the similar scientific platform. I personally met him in Tel Aviv, Israel during a Schumann Resonance Workshop in February, 2017. Meanwhile a closer scientific cooperation has developed on the climate relation of Schumann resonances (SR) and SR inversion to reproduce the global lightning activity. Two common publications have already been achieved and two others were submitted (see the publications listed below).

October 4, 2020

Sátori Gabriella

Gabriella Sátori DSc

Geodetic and Geophysical Institute
Research Centre for Astronomy and Earth Sciences
Eötvös Loránd Research Network
Csatkai u. 6-8.
9400 Sopron, Hungary
satori.gabriella@csfk.mta.hu

E. Prácser, T. Bozóki, **G. Sátori**, J. Takátsy, E. Williams and **A. Guha**, Two Approaches for Modeling ELF Wave Propagation in the Earth-Ionosphere Cavity with Day-Night Asymmetry, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION (submitted,2020**)**

E. Williams, T. Bozóki, **G. Sátori**, C. Price, P. Steinbach, **A. Guha**, Y. Liu, C. Beggan, M. Neska, R. Boldi, and M. Atkinson, Evolution of Global Lightning in the Transition from Cold to Warm Phase Preceding Two Super El Niño Events, Journal of Geophysical Research: Atmospheres (submitted, 2020)

E. Prácser, T. Bozóki, **G. Sátori**, E. Williams, **A. Guha** and H. Yu, "Reconstruction of global lightning activity based on Schumann Resonance measurements: Model description and synthetic tests", Radio Science, (American Geophysical Union), Vol. 54(3), pp. 254-267, 2019.

A. Guha, E. Williams, R. Boldi, **G. Sátori**, T. Nagy, J. Bór, J. Montanya and P. Ortega, "Aliasing of the Schumann resonance background signal by sprite-associated Q-bursts", Journal of Atmospheric and SolarTerrestrial Physics (Elsevier Science), Vol. 165-166, pp. 25-37, 2017.

त्रिपुरा TRIPURA 309855

AGREEMENT

This Agreement is made on this 6th day of October, 2017 at Bhubaneswar BY and BETWEEN **M/s KIIT Technology Business Incubator**, a Section 25 Company incorporated under the Companies Act 1956 having its registered office at Campus 11, KIIT University, Patia, Bhubaneswar, 751024, hereinafter referred to as **"BIG Partner"** (which expression shall wherever the context so admits include its successors and assignees) of the **First Part**

AND

Dr. Shaon Ray Chaudhuri; D/O Dr Dipali Roy Choudhury and Late Dr Bimalendu Ray Chaudhuri, resident of **188/1 M M Datta Road, New Barrackpur, West Bengal** and having the Project implementation site at **KIIT Technology Business Incubator, Bhubaneswar** as incubator, hereinafter referred to as **"BIG Innovator"** (which expression shall wherever the context so admits include its successors in interest, liquidators, administrators and assigns) of the **Second Part**

WHEREAS all the parts are hereinafter referred to as **"Parties"**;

WHEREAS **Biotechnology Industry Research Assistance Council**, A Government of India Enterprise, having its office at MTNL Building, First Floor, 9, CGO Complex, Lodhi Road, New Delhi - 110 003 hereinafter referred to as the "BIRAC" operates a scheme entitled **Biotechnology Ignition Grant Scheme** (hereinafter referred to as "BIG Scheme") to support an innovative idea in the field of biotechnology for proof of concept.

WHEREAS, BIRAC has entrusted the BIG Partner with implementation of the BIG Scheme including necessary processing of the proposals, organizing various meetings and training programs for BIG,

Shaon Ray Chaudhuri

execution of the decisions taken, disbursement of funds, monitoring the physical and financial progress of the Project and to obtain reports and returns and clarifications as required from time to time from the BIG Innovators.

WHEREAS the BIG Innovator has conceived a Project entitled **"Microbial Consortium based biofertilizer for increased Ramie fiber yield"** and submitted a proposal with amendments (hereinafter called "the Project") - for grant-in-aid assistance under BIG Scheme as per **Annexure 1;**

AND WHEREAS BIRAC has approved the Project and agreed to provide assistance to the extent of **Rs. 46.82 glakh (Rupees Forty Six lakhs and eighty two thousand Only)** in the form of grant-in-aid to the BIG Innovator under BIG Scheme on the terms and conditions contained hereinafter in this Agreement.

All Annexures to this Agreement shall be integral part of this Agreement.

NOW THEREFORE, in consideration of the promises and mutual covenants hereinafter contained, the Parties hereto agree as follows:

1. RESPONSIBILITIES OF THE BIG INNOVATOR

a. The BIG Innovator shall:

i. Carry out the activities of the Project and conform to the specified objectives, outputs, milestones, and targets;

ii. Meet the resources on the Project activities to the extent as agreed to, as per details given in Annexure 1;

iii. Submit a utilization certificate and statement of accounts duly audited and/or certified by a chartered accountant for the expenditure incurred on the Project for the half year, ending 31st March and 30th September, to BIG Partner, within a month of 31st March and 30th September for respective half year, in the format provided by BIG Partner;

iv. Submit a milestones progress report to BIG Partner as per the timeline and participate in the meetings organized by BIG Partner to review the progress of the Project, as and when called for;

v. Obtain all the necessary requisite approvals, clearance certificates, permissions and licenses from the Government/local authorities for conducting its operations in connection with the Project;

vi. Keep the drawals from the grant-in-aid assistance in a separate no-lien account in the name of the BIG Innovator with a scheduled bank, the payments from which account shall be subject to verification by BIG Partner/BIRAC. It shall also obtain and furnish to BIG Partner a letter from the said bank foregoing the right of set off or lien in respect of such account

vii. Utilize the amounts sanctioned by BIG Partner for the Project only for the purposes as specified in the Project and shall not entrust the implementation of the Project to another agency or divert the grant-in-aid assistance;

viii. Abide by the decision of BIG Partner/BIRAC to modify the objectives, outputs, milestones, targets, funding as also the foreclosure of the Project or of its components after mutual discussion;

Shaon Ray Chaudhuri

Research Collaboration of **Dr. Swanirbhar Majumder, Department of Information Technology, Tripura University** with **Sinam Ajitkumar Singh, NERIST, Arunachal Pradesh.**

1. "Short Unsegmented PCG Classification based on Ensemble Classifier" Turkish Journal Of Electrical Engineering & Computer Sciences, Turk J Elec Eng & Comp Sci,(2020) 28: 875 – 889. Copyright © 2020 doi:10.3906/elk-1905-165, E-ISSN: 1303-6203, ISSN: 1300-0632.(S. A. Singh, S. Majumder)
2. "Classification of unsegmented PCG recording using KNN classifier", Journal of Mechanics in Medicine and Biology, published by World Scientific Press, Impact factor: 0.468, ISSN (print): 0219-5194 | ISSN (online): 1793-6810. https://doi.org/10.1142/S0219519419500258, Vol. 19, No. 04, 1950025 (2019) DOI: 10.1142/S0219519419500258 (S. A. Singh, S. Majumder)
3. "A novel approach OSA detection using single lead ECG scalogram based on deep neural network", Journal of Mechanics in Medicine and Biology, published by World Scientific Press, Impact factor: 0.468, ISSN (print): 0219-5194 | ISSN (online): 1793-6810. https://doi.org/10.1142/S021951941950026X Vol. 19, No. 04, 1950026 (2019) DOI: 10.1142/S021951941950026X. (S. A. Singh, S. Majumder)
4. "Short and noisy Electrocardiogram classification based on deep learning", Pg 1-34 of book titled, "Deep Learning for Data Analytics-Foundations, Biomedical Applications, and Challenges", edited by Himansu Das, Chittaranjan Pradhan and Nilanjan Dey, ISBN: 978-0-12-819764-6, https://doi.org/10.1016/B978-0-12-819764-6.00002-8 of Elsevier Academic Press. (S. A. Singh, Swanirbhar Majumder)
5. "Short PCG classification based on deep learning", in Book on "Deep Learning Techniques for Biomedical and Health Informatics", Editors: Dr. Basant Agarwal Valentina E. Balas Lakhmi Jain Ramesh Chandra Poonia Manisha Sharma , Pages 141-164 by Elsevier Academic Press. https://doi.org/10.1016/B978-0-12-819061-6.00006-9 (S. A. Singh, T. G. Meitei, Swanirbhar Majumder)
6. "PCG-Based Biometrics", pg 1-25; of book "Handbook of Research on Information Security in Biomedical Signal Processing", DOI: 10.4018/978-1-5225-5152-2, April'2018, by Chittaranjan Pradhan, Himansu Das, Bighnaraj Naik and Nilanjan Dey, ISBN13: 9781522551522|ISBN10: 1522551522|EISBN13: 9781522551539, DOI: 10.4018/978-1-5225-5152-2.ch001 (T. G. Meitei, S. A. Singh and S. Majumder)
7. "Hardware based Analysis of PCG Signal for Heart Conditions" Proceedings of International Conference on Cutting Edge Technologies and Communication Engineering (IC4E-2020) and publication in an edited volume of the book series by the Springer being held at NIT Kurukshetra during 06-07 November 2020 (Takhellambam Gautam Meitei, Sinam Ajitkumar Singh and S. Majumder)
8. "Classification of short unsegmented heart sound based on deep learning" Proceedings of International Instrumentation and Measurement Technology Conference 2019, (I2MTC 2019) of the IEEE I2MTC – International Instrumentation and Measurement Technology Society. May 20-

Research Collaboration of **Dr. Swanirbhar Majumder, Department of Information Technology, Tripura University** with **Joyanta Basu, CDAC, Kolkata.**

1. "Speaker Identification in Spoken Language Mismatch Condition: An Experimental Study", 2020 Third International Symposium on Signal and Image Processing, October 21-22, 2020 held in Online mode In collaboration with CHRIST (Deemed to be University), Bangalore, India. (Joyanta Basu, Swanirbhar Majumder)
2. "Identification of Two Tribal Languages of India: An Experimental Study", 2nd International Conference on Artificial Intelligence and Speech Technology (AIST – 2020) Dates: 19th – 20th November, 2020 (Joyanta Basu, Theodore Raphael Hrangkhawl, Tapan Kumar Basu, Swanirbhar Majumder)
3. "Performance Evaluation of Language Identification on Emotional Speech Corpus of Three Indian Languages", pg-55-63, of Proceedings of Second Doctoral Symposium on Intelligence Enabled Research (DoSIER 2020), Organized by Visva-Bharati University, Santiniketan, India, August 12-13, 2020, as Chapter 6 of Advs in Intelligent Syst., Computing, Vol. 1279, Siddhartha Bhattacharyya et al. (Eds): Intelligence Enabled Research, 978-981-15-9289-8, 498363_1_En, (Chapter 6) http://doi-org-443.webvpn.fjmu.edu.cn/10.1007/978-981-15-9290-4_6 (Joyanta Basu, Swanirbhar Majumder)
4. "Identification of Seven Low-Resource North-Eastern Languages: An Experimental Study", First Doctoral Symposium on Intelligence Enabled Research (DoSIER 2019), Organized by RCC Institute of Information Technology, Kolkata, India, October 19-20, 2019, pg 71-81, In: Bhattacharyya S., Mitra S., Dutta P. (eds) Intelligence Enabled Research. Advances in Intelligent Systems and Computing, vol 1109. Springer, Singapore, https://doi.org/10.1007/978-981-15-2021-1_9, Print ISBN 978-981-15-2020-4, Online ISBN 978-981-15-2021-1(Joyanta Basu, Swanirbhar Majumder)

Research Collaboration of **Dr. Swanirbhar Majumder, Department of Information Technology, Tripura University** with **Dr. A. Dinamani Singh, Associate Professor, NIT Manipur, Imphal**.

1. “A Mathematical Modelling And 3D Simulation Of ZnO Piezoelectric Base Cantilever For Pressure Sensing", Page 37-41 of IJSTR(International Journal of Scientific & Technology Research) Volume 9 - Issue 9, September 2020 Edition - ISSN 2277-8616, (Maibam Sanju Meetei, Aheibam Dinamani Singh, Swanirbhar Majumder, Ome Moyong)
2. “A Mathematical Modelling and 3D Analysis of PZT-5H Piezoelectric Base Bridge Pressure Sensor” , International Journal of Mechanical Engineering and Technology (IJMET), Volume 10, Issue 11, November 2019, pp. 407-415, Article ID: IJMET_10_11_034, Available online at http://www.iaeme.com/ijmet/issues.asp?JType=IJMET&VType=10&IType=11, ISSN Print: 0976-6340 and ISSN Online: 0976-635, (Maibam Sanju Meetei, Aheibam Dinamani Singh, Swanirbhar Majumder)
3. “An Engineering Approach for Modeling and Design of a Diaphragm Based Comb Drive Capacitive Pressure Sensor”, Proceedings of 5th International Conference on Information & Management Skills (ICCM) 2019, pg 70-73, ISSN: 1556-5068, SSRN: https://ssrn.com/abstract=3516732 (Maibam Sanju Meetei, Aheibam Dinamani Singh, Swanirbhar Majumder)
4. “A Novel Design and Modeling of Beam Bridge structure Piezoelectric Pressure Sensor base on ZnO”, Proceedings of 5th International Conference on Information & Management Skills (ICCM) 2019, pg 106-110, ISSN: 1556-5068, SSRN: https://ssrn.com/abstract=3517369 (Maibam Sanju Meetei, Aheibam Dinamani Singh, Swanirbhar Majumder)

AGU PUBLICATIONS

JGR

Journal of Geophysical Research: Atmospheres

RESEARCH ARTICLE

10.1002/2016JD025592

Key Points:
- Distinct anthropogenic and natural linkages to the spectral absorption characteristics of aerosols over northeastern India
- The western part is mostly impacted by the fossil fuel-based BC, while biomass burning contributes as much as 20-25% in the eastern part
- Fire-induced additional local convection that cause stronger vertical dispersion of absorbing aerosols during spring leads to higher atmospheric warming

Correspondence to:
M. M. Gogoi,
dr_mukunda@vssc.gov.in

Citation:
Gogoi, M. M., et al. (2017), Radiative effects of absorbing aerosols over northeastern India: Observations and model simulations, *J. Geophys. Res. Atmos.*, *122*, 1132–1157, doi:10.1002/2016JD025592.

Received 29 JUN 2016
Accepted 5 JAN 2017
Accepted article online 7 JAN 2017,
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Radiative effects of absorbing aerosols over northeastern India: Observations and model simulations

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1. Introduction

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Key Points:
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