

Space Weather Activities in Pakistan

ISWI Steering Committee Annual Meeting
February 11, 2022

Presented By:

Dr. Najam Abbas Naqvi

National Coordinator - ISWI

Chairman - National Center of GIS & Space Applications

Head of Space Science Department

Institute of Space Technology, Islamabad



GNSS Winter School 2021

- Conducted by National Center of GIS & Space Application (NCGSA) at Institute of Space Technology, Islamabad from [February 22 – 26, 2021](#)
- [5-day school](#) targeted at GNSS for Students & Professionals
- Special Session on [GNSS Space Weather Applications](#)
 - Resource Person: Dr. Munawar Shah (Assistant Professor – Institute of Space Technology)
 - Participants: International & National Students and Professionals from Public & Private Sector Organizations
 - Participant Countries: [Pakistan, USA, Nigeria, Argentina, Malaysia, Peru, Kenya, Ireland, France and Sri Lanka.](#)

International Conference on Aerospace Science & Engineering (ICASE) 2021

- Conducted by National Center of GIS & Space Application (NCGSA) & Institute of Space Technology, Islamabad
- [3-day international conference](#) with [60+ sessions](#) and [65+ international & national keynote speakers](#)
- Special Sessions on Space Weather

- **Special Sessions on Space Weather at ICASE 2021**
 - **Plenary Session: GNSS & Space Weather**
 - Session Chair: Dr. Christine Amory Mazaudier – France
 - Session Co-Chair: Dr. S. Zaineb Farooq – Pakistan
 - Speakers:
 - Dr. Jean L. Rasson - Belgium
 - Dr. Nadia Imtiaz - Pakistan
 - Dr. Andres Calabia Aibar - Spain
 - Mr. M. Ayyaz Ameen – Pakistan
 - **Panel Discussion: Space Weather & GNSS**
 - Panelists:
 - Dr. Christine Amory Mazaudier – France
 - Dr. Andres Calabia Aibar - Spain
 - Dr. Muhsan Ehsan - Pakistan
 - Mr. M. Ayyaz Ameen - Pakistan
 - Dr. Munawar Shah – Pakistan
 - **Technical Session: Space Weather**
 - Session Chair: Dr. Christine Amory Mazaudier – France
 - Session Co-Chair: Dr. Salar Ali - Pakistan



- **Special Sessions on Space Weather at ICASE 2021**
 - **Workshop on Geomagnetism & Ionosphere**
 - Resource Persons: Dr. Mamoru Ishii - Japan
 - Dr. Yun - Korea
 - Dr. Jean L. Rasson - Belgium
 - Prof A. Babatunde Rabiou - Nigeria
 - Dr. Christine Amory-Mazaudier - France
 - Dr. Zahra Bouya - Australia
 - Dr. Chen Li - China
 - Mr. Afnan Tahir - Pakistan
 - Dr. Pornchai Supnithi - Thailand
 - Dr. Munawar Shah - Pakistan
 - Mr. Arslan Tariq - Pakistan
 - Dr. Relly Margiono - Indonesia
 - Dr. Christian Monstein - Switzerland
 - Ms. Muneeza M. Ali - Pakistan

MS Research Thesis Completed

S. No.	Title	Student	Supervisor
1	Possible Seismo-Ionospheric Anomalies Associated with 11 Earthquakes occurred in 2018 using GNSS TEC: A Statistical Analysis	Muhammad Arqam Adil	Dr. Munawar Shah
2	Investigation of the Possible Ionospheric Anomalies associated with the Earthquake using Demeter and GNSS-TEC: A Case Study from Taiwan	Abdur Rafeh Abbasi	Dr. Munawar Shah
3	Comparison of GPS TEC with IRI Models of 2007, 2012, and 2016 over Sukkur, Pakistan	Adil Hussain	Dr. Munawar Shah

Conference Publications

S. No.	Title	Author	Conference
1	Performance evaluation of IRI models over mid latitude during ascending phase of solar cycle 25	Rasim Shahzad, Amna Hafeez, Dr. Munawar Shah	ICASE 2021
2	Machine learning based thermal anomaly detection associated with three earthquakes in Pakistan using MODIS LST	Amna Hafeez, Rasim Shahzad, Dr. Munawar Shah	ICASE 2021

Technical Reports

S. No.	Title	Theme / Purpose
1	GNSS Ionospheric Scintillation and TEC Monitor (GISTM) Receiver	GISTM specifications, applications and working

Journal Publications

S. No.	Title	Author(s)	Journal	Impact Factor
1	Comparison of VTEC from GPS and IRI-2007, IRI-2012 and IRI-2016 over Sukkur Pakistan	Rasim Shahzad, Munawar Shah , Arslan Ahmed	Astrophysics and Space Science	1.83
2	Machine learning-based thermal anomalies detection from MODIS LST associated with the Mw 7.7 Awaran, Pakistan earthquake	Amna Hafeez, Rasim Shahzad, Muhsan Ahsan, Munawar Shah , Ayesha Abbas	Natural Hazards	3.102
3	Total electron content anomalies associated with earthquakes occurred during 1998–2019	Munawar Shah , Arslan Ahmed, Muhsan Ehsan, Majid Khan, Muhammad Arslan Tariq, Andres Calabia	Acta Astronautica	2.83
4	Seismo ionospheric anomalies in Turkey associated with $M_w \geq 6.0$ earthquakes detected by GPS stations and GIM TEC	Munawar Shah , Samed Inyurt, Muhsan Ehsan, Arslan Ahmed, Muhammad Shakir, Saleem Ullah, Muhammad Shahid Iqbal	Advances in Space Research	2.177
5	Seismo ionospheric anomalies possibly associated with the 2018 Mw 8.2 Fiji earthquake detected with GNSS TEC	Amna Kiyani, Munawar Shah , Arslan Ahmed, Hasrat Hussain Shah, Saman Hameed, M. Arqam Adil, Najam A. Naqvi	Journal of Geodynamics	1.855
6	Artificial Neural Network based thermal anomalies associated with earthquakes in Pakistan from MODIS LST	Munawar Shah , Rizwan Ullah Qureshi, Nangyal Ghani Khan, Muhsan Ehsan, Jianguo Yan	Journal of Atmospheric and Solar-Terrestrial Physics	1.503
7	Comparison of TEC from IRI-2016 and GPS during the low solar activity over Turkey	M. Arslan Tariq, Munawar Shah , Samed Inyurt, M. Ali Shah, Libo Liu	Astrophysics and Space Science	1.43
8	Comparison of VTEC from GPS and IRI-2007, IRI-2012 and IRI-2016 over Sukkur Pakistan	Rasim Shahzad, Munawar Shah , Arslan Ahmed	Astrophysics and Space Science	1.43
9	Possible ionospheric anomalies associated with the 2009 M w 6.4 Taiwan earthquake from DEMETER and GNSS TEC	Abdur Rafeh Abbasi, Munawar Shah , Arslan Ahmed, Najam Abbas Naqvi	Acta Geodaetica et Geophysica	0.909

