RAFCOM

Radio Frequency Committee of Malaysia

Head: Zamri Zainal Abidin (Universiti Malaya, Malaysia)

Set up on: 27 April 2021

RAFCOM keeps track of RFI monitoring efforts in Malaysia (mainly below 10GHz)

RAFCOM

- 5 MEMBERS FROM 4 INSTITUTES
  - UM - UNIVERSITI MALAYA : Zamri Zainal Abidin & ZulFazli Rosli
  - UNISZA - UNIVERSITI SULTAN ZAINAL ABIDIN : Roslan Umar
  - UNM – UNIVERSITY OF NOTTINGHAM MALAYSIA : Nafizah Khan
  - USIM – UNIVERSITI SAINS ISLAM MALAYSIA : Ifwat Ghazali
- Main aims of this committee are:
  1. Report on RFI surveys/studies/issues.
  2. Report on RQZ setup/plans/issues,
  3. Collective approach to MCMC,
  4. Discuss contributions and gather information for RAFCAP/IUCAF/WRC etc.
- Meetings (not as regular as we should have been doing)
  1. 27th April 2021
  2. 25th April 2023
  3. 15th April 2025

RNZ at Jelebu

- RFI monitoring reports since 2009 (8 articles)
  - Investigation of radio astronomical windows between 1 MHz and 2060 MHz in Universiti Malaya, Malaysia, Abidin, ZZ; Ibrahim, ZA; (...); Anuar, NK, **Aug 2009**, NEW ASTRONOMY
  - RFI profiles of prime candidate sites for the first radio astronomical telescope in Malaysia, Abidin, ZZ; Adnan, SBRS and Ibrahim, ZA, **Mar 2010**, NEW ASTRONOMY
  - An RFI investigation for setting up a VLBI station below 2.8 GHz in Malaysia, Abidin, ZZ; Ibrahim, ZA; (...); Noorazlan, N, **Feb 2010,** NEW ASTRONOMY
  - Investigation on the Frequency Allocation for Radio Astronomy at the L Band, Abidin, ZZ; Umar, R; (...); Gasiprong, N, **Sep 3 2013.** PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF AUSTRALIA
  - Selection of radio astronomical observation sites and its dependence on human generated RFI, Umar, R; Abidin, ZZ; (...); Noorazlan, N, **Feb 2014,** RESEARCH IN ASTRONOMY AND ASTROPHYSICS
  - Radio frequency interference in solar monitoring using CALLISTO, Abidin, ZZ; Anim, NM; (...); Sukma, I, **Aug 2015,** NEW ASTRONOMY REVIEWS
  - MULTI-CRITERIA DECISION ANALYSIS INTEGRATED WITH GIS FOR RADIO ASTRONOMICAL OBSERVATORY SITE SELECTION IN PENINSULAR OF MALAYSIA, Umar, R; Abidin, ZZ; (...); Juahir, H, **2017,** JOURNAL OF FUNDAMENTAL AND APPLIED SCIENCES
  - Radio quiet and radio notification zones characteristics for radio astronomy in medium densely populated areas and humid tropical countries, Abidin, ZZ; Rosli, Z; (...); Hashim, N, **Apr 2021**, JOURNAL OF ASTRONOMICAL TELESCOPES INSTRUMENTS AND SYSTEMS
- Construction:
  - Current: We have a few Low frequency antennas (below 1GHz) **in Jelebu for solar astronomy**
  - Future : L-band & X-band dishes (VGOS & another telescope) **in Jelebu for HI & other sciences**
- **Latest paper:** Report on RFI data for a RNZ at Jelebu (**A.A.Nazri et al 2025 accepted**)
  - https://www.sciencedirect.com/science/article/abs/pii/S0273117725004946

Available online at www.sciencedirect.com

ScienceDirect

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Temporal variability in low-frequency radio interference: Insight from high-cadence monitoring at a candidate radio notification zone in Malaysia

Affan Adly Nazri[a], Zamri Zainal Abidin[a,*], Mohamad Ridhauddin Mat Sabri[a], Zulfazli Rosli[a,b], Mohd Shaiful Rizal Hassan[a], Mohd Shazwan Mohd Radzi[a], Ahmad Najwan Zulkiplee[a], Dalilah Nur Fathiah Hanim Razak[a], Norsyazwani Asmi[a], Jinsong Ping[c], Mingyuan Wang[c], Liang Dong[d,e]

[a] *Department of Physics, Faculty of Science, Universiti Malaya, Kuala Lumpur, 50603, Malaysia*
[b] *Centre of Foundation, Language and Malaysian Studies, Universiti Malaya-Wales, Kuala Lumpur, 50480, Malaysia*
[c] *National Astronomical Observatories, Chinese Academy of Sciences, Beijing, 100012, People's Republic of China*
[d] *Yunnan Astronomical Observatory, Chinese Academy of Sciences, Kunming, 650216, People's Republic of China*
[e] *Yunnan Sino-Malaysian International Joint Laboratory of HF-VHF Advanced Radio Astronomy Technology, Kunming, 650216, People's Republic of China*

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Abstract

Extensive radio frequency interference (RFI) monitoring is essential in the site selection process before constructing radio astronomy observatories, followed by mitigation strategies to minimize its adverse effects. Malaysia has an enormous prospect for radio astronomy due to its prominent location in the centre of Southeast Asia, but is challenged by its relatively high population density. In this research article, we perform high-cadence, low-frequency RFI monitoring at two sites, each representing an urban and a rural environment. Using modified generalized spectral kurtosis (GSK) as an RFI detection method, we ascertain the suitability of Glami Lemi, a rural area in the centre of Peninsular Malaysia previously assigned as a candidate radio notification zone (RNZ), as a potential site for radio astronomy observations due to its lower RFI contamination in our high-cadence monitoring, especially when compared with urban areas. We identified a number of persistent and transient RFI in our dataset, associate each of them with their potential origins and, if present, characterize their temporal evolution. A few types of RFI mitigation strategies were also tested and discussed. This study lays the groundwork for Malaysia's endeavours in establishing its first research-grade radio telescope, emphasizing the importance of robust RFI detection and mitigation strategies in optimizing observational outcomes.

Thank you