PROJECT PERIOD
11 June 2023 – 10 June 2028 (5 years)

PROJECT SITE
Between Kuala Lumpur and Melaka, Malaysia

CORE RESEARCH INSTITUTIONS
Universiti Teknikal Malaysia Melaka (UTeM)
Universiti Tenaga Nasional (UNITEN)
Kindai University (KINDAI)

SUPPORT INSTITUTIONS
Ministry of Higher Education (MoHE)
Ministry of Science, Technology and Innovation (MOSTI)
Japan Science and Technology Agency (JST)
Japan International Cooperation Agency (JICA)

PARTNER RESEARCH INSTITUTIONS
TNB Research Sdn. Bhd. (TNBR)
Malaysian Meteorological Department (MET Malaysia)
Department of Irrigation and Drainage (DID)
Universiti Teknologi MARA (UiTM), Jasin Campus
Universiti Teknologi MARA (UiTM), Shah Alam
Melaka Corporation (MCORP)
Kolej UNITI (KU)
Malacca Astronomy Site/ Majlis Mufti Melaka (FALAK)
Telekom Malaysia (TM) (Candidate)

Gifu University
Chubu University
University of Fukui
OTOWA ELECTRIC CO., LTD. (OTOWA)
The University of Electro-Communications (UEC)

MAIN OFFICE
Centre of Technology for Disaster Risk Reduction (CDR)
Fakulti Teknologi dan Kejuruteraan Elektronik dan Komputer (FTKEK)
Universiti Teknikal Malaysia Melaka (UTeM)
Hang Tuah Jaya, 76100, Durian Tunggal, Melaka, MALAYSIA


RTL site in Kanazawa, Japan

RTL-3D: KILAT

Real Time Lightning 3D Imaging and Forecasting Project for Sustainable and Reliable Supply of Energy and Storm Disaster Early Warning

RTL-3D: KILAT

The RTL-3D project seeks to reduce lightning-related fatalities, injuries, and property damage caused by lightning strikes and flash floods in Malaysia by leveraging advanced solutions. These innovations aim to forecast lightning hazards before they occur, enhancing disaster preparedness and response.

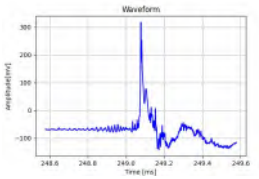
Real-time lightning 3D imaging model

To achieve this, advanced algorithms are being developed to map lightning and charge distribution in three dimensions with exceptional precision, achieving an accuracy of less than 10 meters. This breakthrough significantly improves the understanding of lightning activity and its impact on infrastructure and communities. Direct lightning current measurements using Rogowski coils on rocket-triggered lightning (RTL) experiments and tall structures are conducted to achieve precise validation of these algorithms.

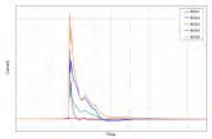
A key outcome of the project is the development of algorithms capable of forecasting flash flood events based on lightning parameters. These state-of-the-art systems are integrated with advanced ICT infrastructure to minimise the risks of flash floods and lightning strikes, thereby safeguarding lives and property.

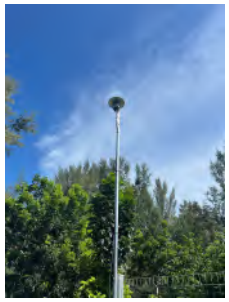
Lightning Strikes Captured by Our Sensors

Low Frequency (LF) Sensor



Current Sensor





Low Frequency (LF) Sensor

Lightning observation network

Complementing these efforts, lightning sensors and weather monitoring networks have been deployed at strategic locations across Malaysia, including Kuala Lumpur, Selangor, Negeri Sembilan, and Melaka. These systems enable real-time monitoring of lightning activity, providing critical data for disaster preparedness. By integrating monitoring capabilities with advanced forecasting tools, the project aims to enhance safety, deepen scientific knowledge, improve quality of life, and promote sustainable socio-economic development in Malaysia.

Social implementation products

The project also extends its social impact by developing real-time monitoring and forecasting dashboards and applications. A device that automatically switches between commercial and backup power is being developed as well to improve power resilience in critical situations. These tools are specifically tailored for end-users such as fishermen in Melaka, engineers at Tenaga Nasional Berhad (TNB), and personnel at the Malaysian Meteorological Department (MET Malaysia), ensuring the dissemination of timely and actionable information for better decision-making.

RTL site at Jasin, Melaka, Malaysia