

BOLT

**Broadband Observatory for
Lightning and Thunderstorm**

 **REPCO NEX**
INDUSTRIAL SOLUTIONS





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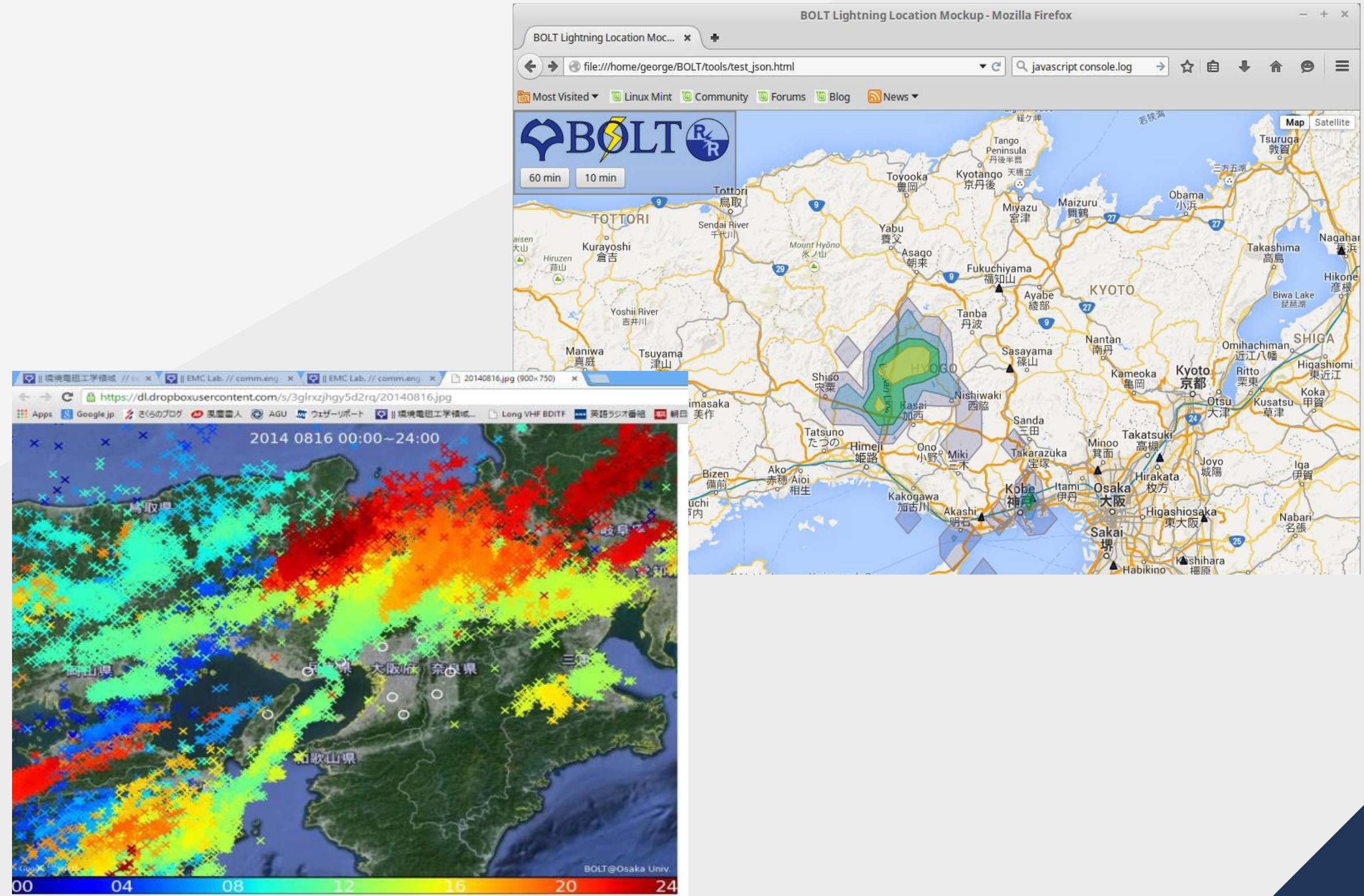
BOLT Origin

An example of GUI of BOLT for Osaka sites, Japan



BOLT Inventor

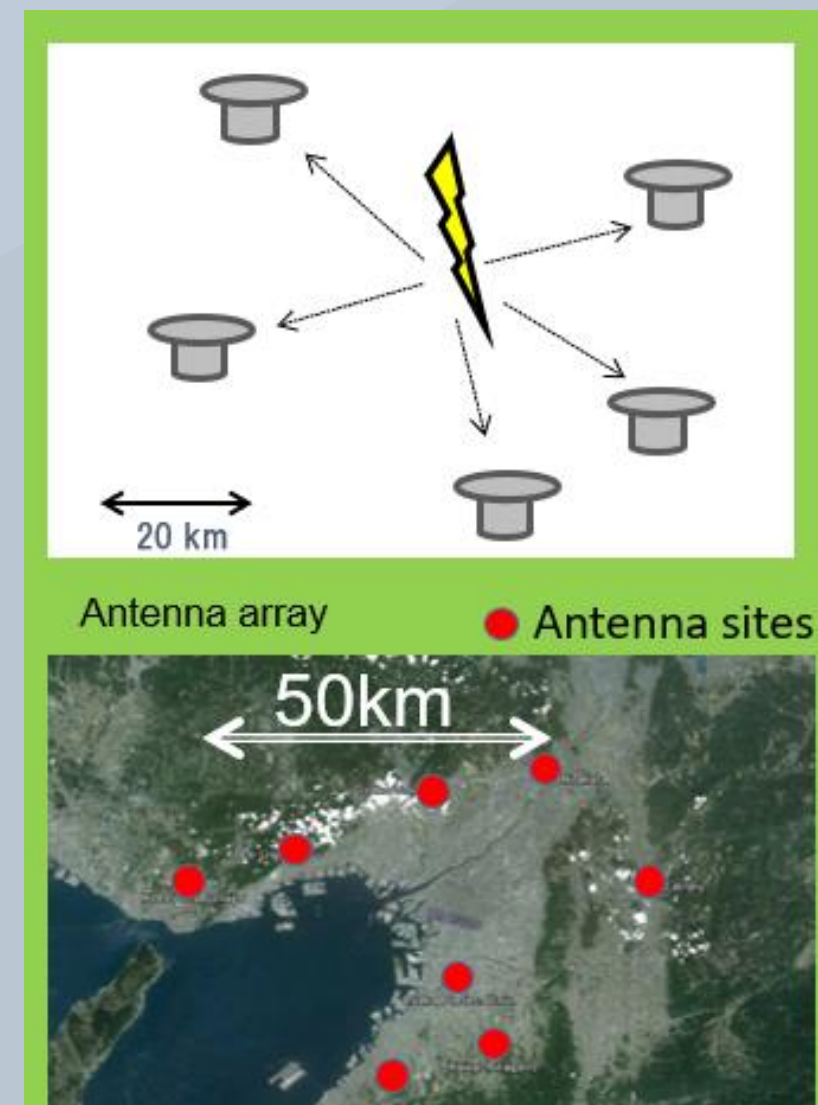
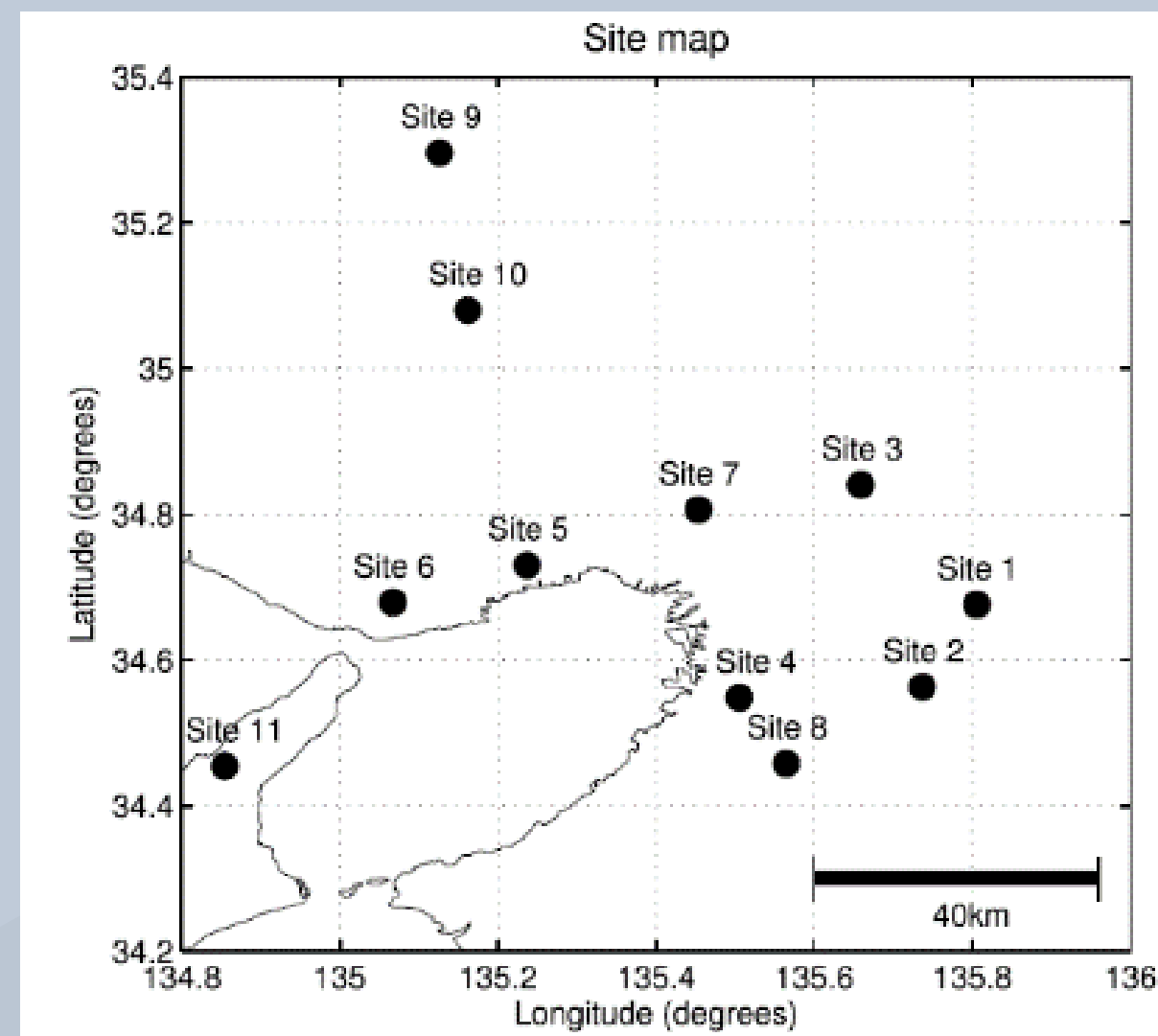
Professor Kawasaki Zenichiro
From : Critical Facility



BOLT Deployment

BOLT deployment and operation in Osaka, Japan since 2013

Consists of 13 LF sensors installed in the Kansai area in Japan covering an area of about 90 x 90 km².
The mean distance between stations is approximately 20km



BOLT Antenna



Specifications

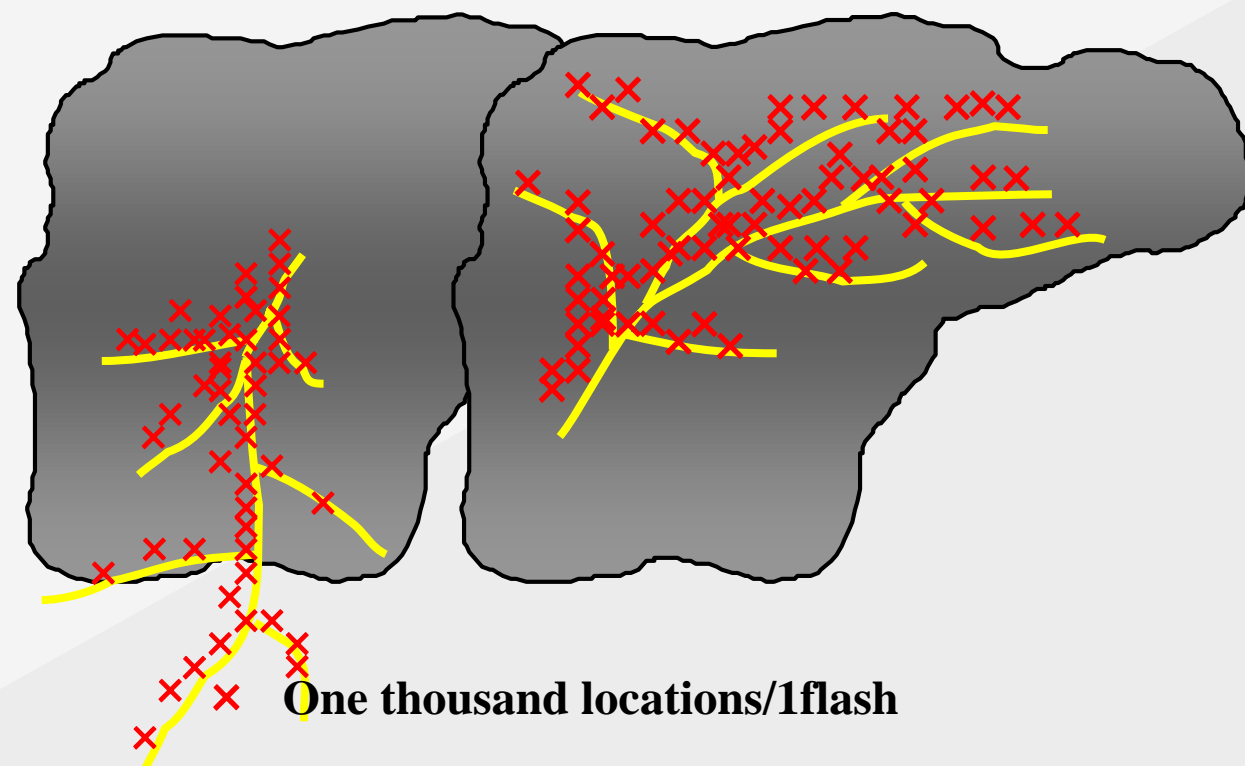
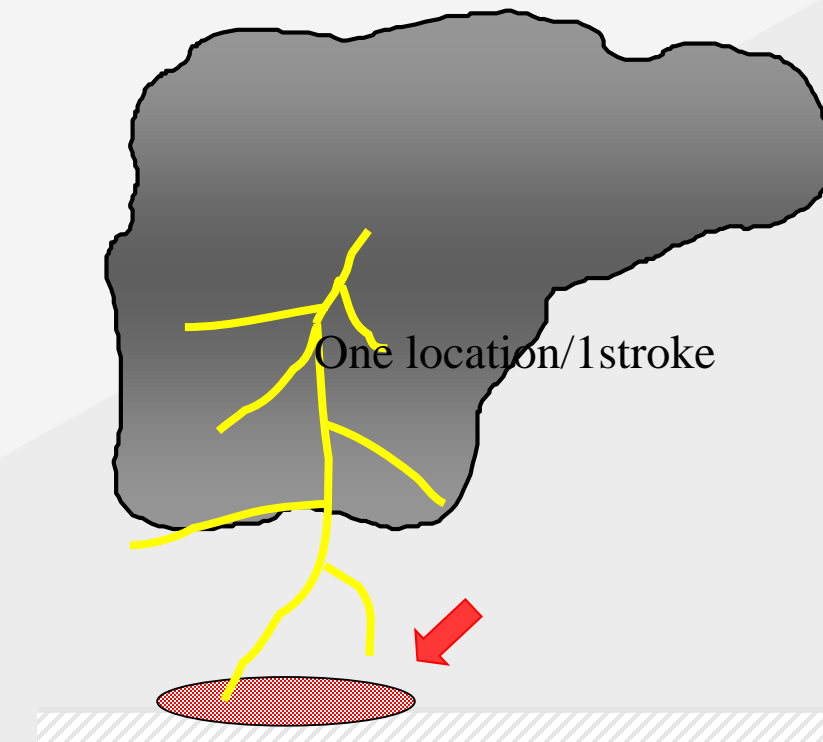
Pass band	~ 500kHz
Sampling rate	4MHz
Amplitude Resolution	16 bit
Time resolution	1 ms
Time constant	200 μ s

BOLT EM wave remote sensing

Classical VLF/LF(Existing System)

Radiation from lightning strokes

- One LF pulse per stroke
- Low spatial and time resolution
- Like still picture



Our VLF/LF BOLT system

Radiation from lightning discharge development

- One thousand pulses for LF
- High spatial and time resolution
- Like movie picture

Key Activities

Nowcast lightning activity and chance to terminate in specific area

Early warning if high risk of lightning hit in specific area * >30mins in advance, >20 mins if overhead formation

Ability to declare start and end of thunderstorm activity

BOLT Advance Feature



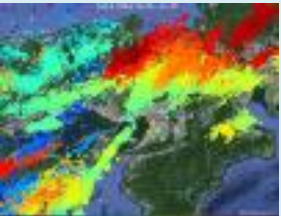

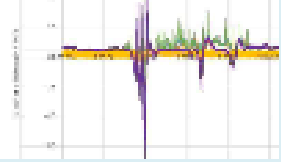





BOLT deployment required 7 stations to cover Rayong area and given more accurate information. Client do not need to maintain the asset !

Report of lightning historical data and other such as information such as Thunderstorm day, location of Lightning terminated

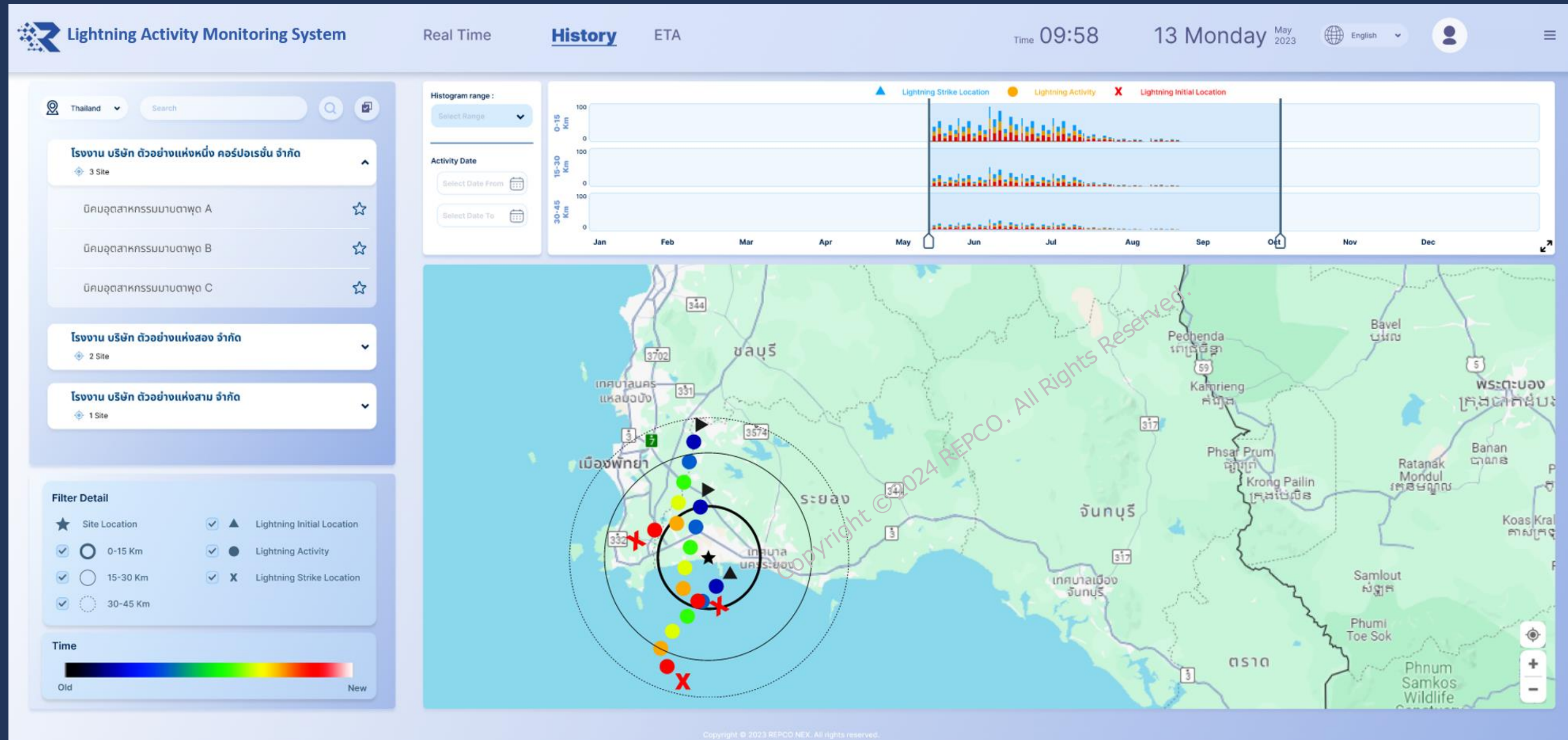
Alarm viewer software and Line, Email, SMS notification

Real time lightning activity information data (CC and CG) and other weather data around plant within 30 - 40 km

Lightning Monitoring Technology

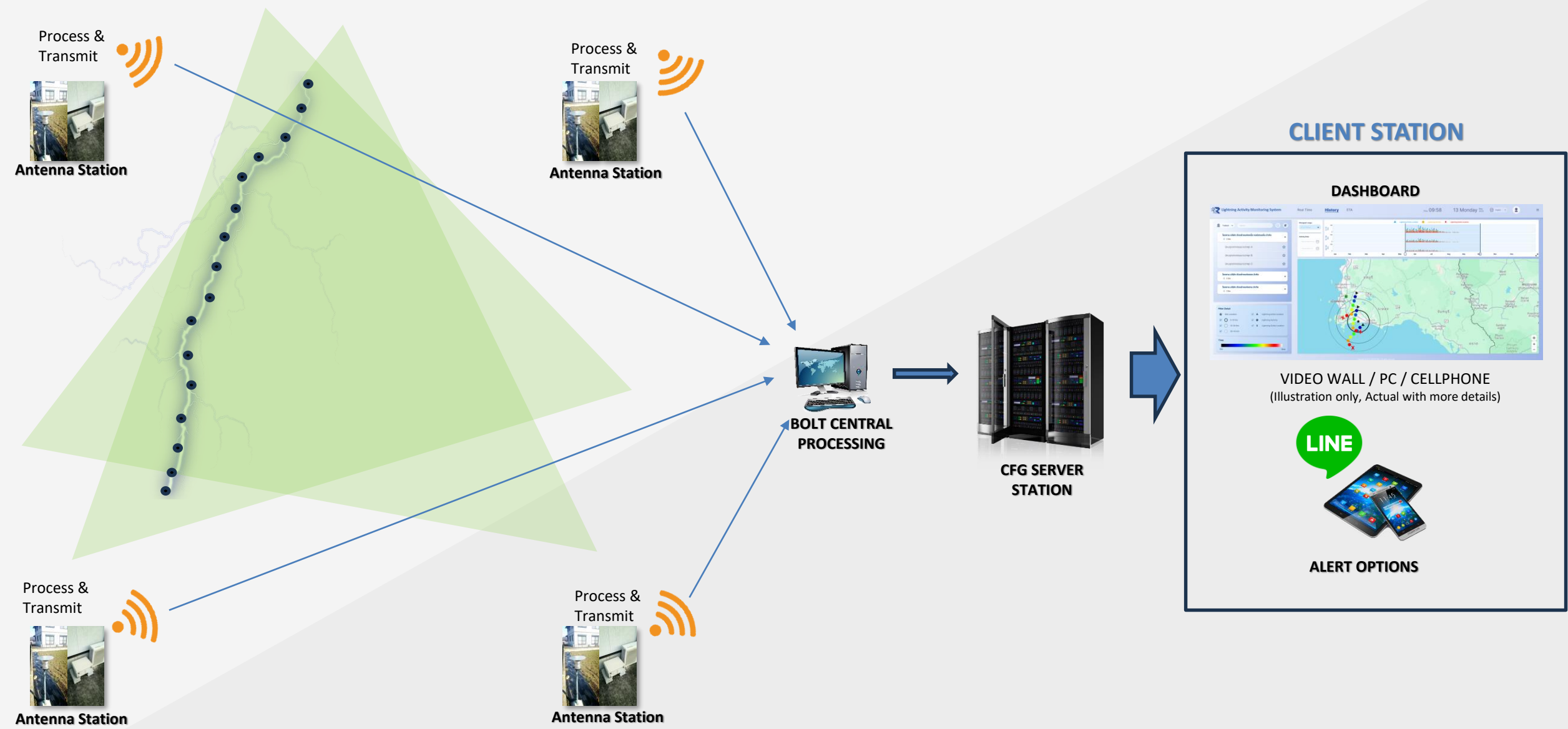
Type	Technology Range	Technique	Photo	Features				Overhead lightning warning	Price
				Early Warning	Tracking Location	Coverage area	Accuracy		
Weather Radar	MICROWAVE	Sending pulse wave and detect echo		Yes, Need interpreter	Yes	150 – 200 km	Good	Yes	
<u>BOLT</u>	LF	Detect and capture EM wave from lightning discharge		Yes	Yes	50 - 100 km	Good	Yes	
E-Field Mill	Electric Field	Measure E-field change		Yes (not accurate)	No	5 km	Fair	Yes (not accurate)	
Warning system in market	M-Field, E-Field	Combines interferometry and E-field changes		Yes (after 1 st strike)	Yes	56 km	Fair	No	
Handheld lightning tracking	LF	Detect wave emitting from lightning		No	No	56 km (not accurate)	No	No	

BOLT Dashboard.....



DETECTION -> PROCESSING -> INFORMATION FLOW

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THANK YOU

*We look forward to working
with you*

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