

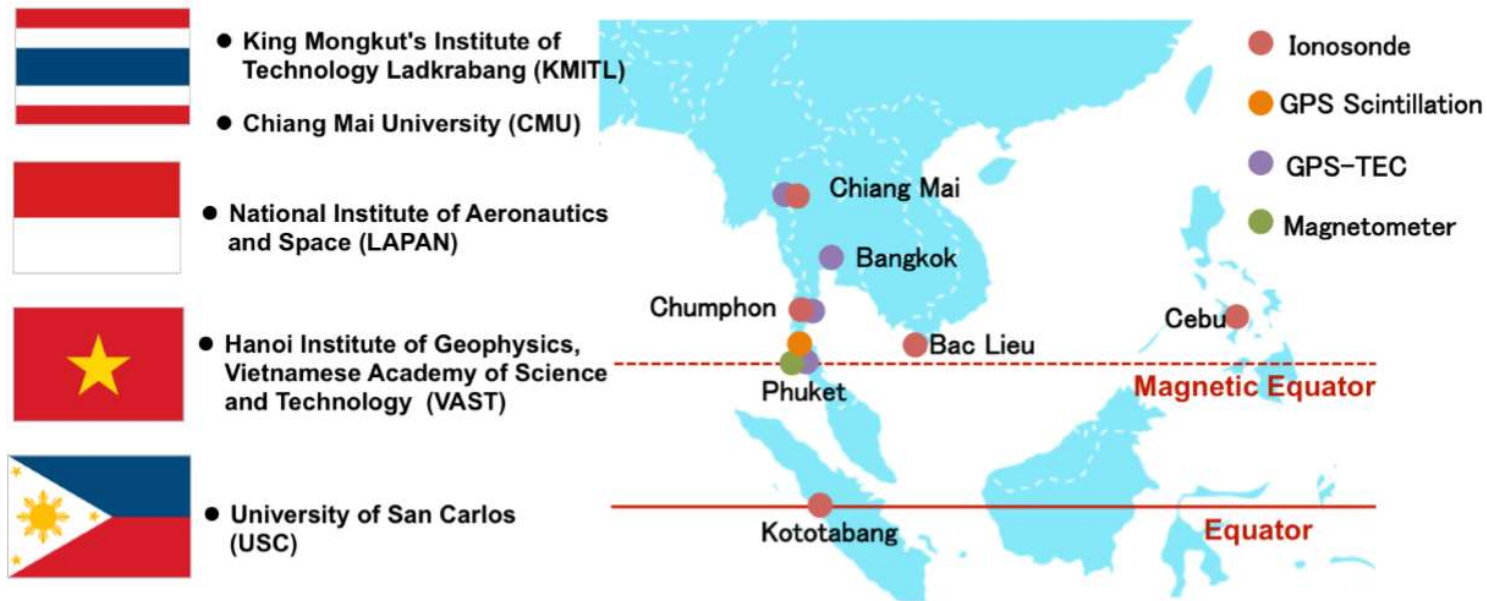
SEALION activities in Southeast
Asia and space weather initiatives
at KMITL, Thailand

SEALION

SEALION (South East Asia Low-latitude Ionospheric Network) is an ionospheric observation network in Southeast Asia. Implemented by NICT since 2003 for the purpose of monitoring and forecasting the equatorial ionosphere, especially plasma bubbles. SEALION is one of the few observation bases in the world in that it has conjugate observation points around the magnetic equator.

We operate an observation network in collaboration with KMITL, CMU in Thailand, LAPAN in Indonesia, USC in the Philippines and VAST in the Socialist Republic of Vietnam.

SEALION (SouthEast Asia Low-latitude IOnospheric Network)




Joint research on space weather between KMITL and NICT

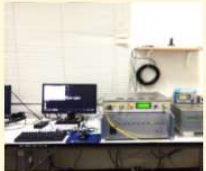
NICT has been collecting data on KMITL and ionosphere in Thailand since 2003. In 2020, we also started VHF radar observations at KMITL's Chumphon to observe ionospheric plasma bubbles.

In addition to such long-term collaborative work, we also invite KMITL graduate students to NICT and provide support such as research guidance and training.

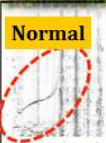
GPS receiver and ionosonde at Chumphon



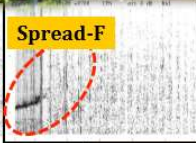
Antenna



Ionosonde equipment




Normal




Spread-F

The ionogram data is observed by the ionosonde. The ionogram is explained the virtual high, critical frequency (foF2) and spread-F of the ionosphere.


GPS and beacon receivers at Bangkok




GPS receiver




Antenna



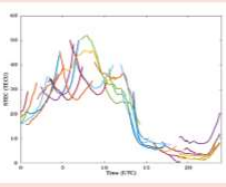
GPS receiver equipment



Beacon receiver



Antenna



STEC data from GPS receiver

Beacon receiver

Magnetometer at Phuket



Joint research on space weather between KMITL and NICT

We are also launching KMITL's space weather site in KMITL in cooperation with NICT.

The image shows two web browser windows side-by-side, connected by a blue handshake icon and a large orange arrow labeled 'Collaboration'. The left window displays the 'THAI SPACE WEATHER INFORMATION CENTER' website with a URL of <http://iono-gnss.kmitl.ac.th>. The right window displays the 'SouthEast Asia Low-latitude IONospheric Network (SEALION)' website with a URL of <http://seg-web.nict.go.jp/sealion/>. The NICT logo is also visible in the top right of the image.

Collaboration

Site (ID)	Lat.	Lon.	Dip Lat.	Country
Chiang Mai (CML)	18.76	98.93	12.7	Thailand
Bangkok (KM)	13.73	100.78	6.7	Thailand
Chumphon (CPN)	10.72	99.37	3.0	Thailand
Phuket (PKT)	8.09	98.32	-0.2	Thailand
Phuket (PTC)	7.90	98.39	-0.4	Thailand
Katubang (KTB)	-0.20	100.32	-10.1	Indonesia
Phu Thuy (PFT)	21.03	105.96	15.6	Vietnam
Bac Lieu (BCL)	9.30	105.71	1.5	Vietnam
Hainan (HAN)	19.53	109.13	13.7	China
Cebu (CEB)	10.35	123.91	3.09	Philippines

In November 2019, we concluded an MOU for space weather research with GISTDA (Geo-Informatics and Space Technology Development Agency), which is a space agency under the Ministry of Science and Technology of the Kingdom of Thailand.