Infrasound multi-site observation of thunders 4: regional testing process for SATREPS

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Here we will introduce current status for the SATREPS/ULAT project in infrasound observation aspect for thunder remote-sensing. Infrasound, low-frequency sound of 20 Hz or less, is considered as one of the possible method for estimating lightning/thunder energy. The infrasound sensors have been and/or now are to be deployed for the SATREPS/ULAT project in Philippine, especially in Manila region since early 2019. We use two types of infrasound sensors: Small but impulsive pressure changes caused by the rapid expansion of the heated plasma along the path of lightning strikes can be detected by infrasound sensors with higher sensitivity range of 1 mPa. Thus, we will use multiple film type (DC type) infrasound sensor for low frequency measurements. But for the thunder infrasound signals, lower-cost microphone type (AC type) sensors can be also applied for measurements. Thus, we will mainly use many microphone type infrasound sensors in Metro Manila region.
It is expected that the multi-site infrasound observation can reveal the lightning activities as close as 100 m scale when the infrasound sensors can be installed with a mesh of 10 km scale or less by using the speed of sound as a precise remote-sensing scale. Recently, we tried regional testing with 6 AC-type sensors for checking the capability of remote-sensing in Kochi area by using real thunder signals with some other methods to compare. At present, we have several results for energy estimation with comparing dataset obtained by JLDN electro-magnetic wave remote-sensing results.
In this talk, we will introduce a possibility of infrasonic remote-sensing and its field testing phase, in order to realize future disaster-mitigation studies and applications.

Keywords: Infrasound, Thunder, Energy estimation

