**Introduction:** In the course of monitoring radionuclide concentrations in the atmosphere for verification of compliance to the Comprehensive Nuclear Test-Ban Treaty, the Radionuclide component of the International Monitoring System of the Comprehensive Nuclear Test-Ban Treaty (CTBTO) generates huge amount of data which have potential use for scientific studies and civil applications. This study exploits this potential by utilizing the International Data Center (IDC) Reviewed Radionuclide Report to establish a profile of $^7$Beryllium and its relationship to meteorological parameters. $^7$Be, a naturally occurring radionuclide with a half-life of 53.29 days, has been reported in several studies to have various applications in the atmospheric and earth sciences. Most of these applications of $^7$Be require a detailed understanding of its distribution and behavior within different environmental systems and at different geographical locations (Doering, 2007).

This poster presents the initial report on the study of the temporal and seasonal patterns of activity concentrations in near surface air and depositions of this radionuclide in the Philippines which seeks to contribute to the understanding of its behavior in this part of the world.

**DATA AND METHODS:**
$^7$Be air concentration data were extracted from the IDC Reviewed Radionuclide Reports (RRR) for the period 2007-2012 for PHIPS2 RN station in Tanay, Rizal. The station, situated approximately 450m above sea level at 14.58N latitude and 121.37E longitude, is part of the CTBTO’s International Monitoring System which is primarily intended for monitoring nuclear explosions. For this study, however, the data is utilized for a scientific purpose. IMS RN stations collect air samples on a filter using a high powered air sampler 7 days a week / 24 hours a day, decay samples for 24 hours and perform gamma spectroscopy to identify and measure radioactivity of radionuclides present in the samples.

The following data were extracted from the RRR using a C++ program specifically developed for the purpose:
1. Acquisition Stop Time (used as the reference date)
2. Sampling Quantity
3. Sampling Time
4. $^7$Be Concentration values
5. Relative Error

Meteorological daily data (rainfall, temperature and relative humidity) for the corresponding period were sourced out from the local weather agency, Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA).

The $^7$Be and meteorological data were aggregated and analyzed to establish correlations and effects of the meteorological parameters to the temporal variations of $^7$Be radioactivity concentration and deposition.

**RESULTS AND DISCUSSION:**

1. **Temporal Patterns of $^7$Be activity concentration**
   The concentration of $^7$Be from 2007-2012 was found to be in the range of 0.72 - 4.70 mBq m$^{-3}$ with a mean of 1.98 ± 1.03. The summary of the yearly concentrations is shown in Table 1. The temporal patterns of $^7$Be with temperature, relative humidity and rainfall are shown in Figures 1, 2 and 3, respectively. The seasonal variation of $^7$Be concentration with amount of rainfall is shown in Figure 4. It is important to note that the Philippines has only two pronounced seasons, dry and wet, which is primarily characterized by the amount of rainfall. A good correlation was found both for relative humidity and amount of rainfall (Table 2).

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean $^7$Be concentration (mBq/m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1.88 ± 0.93</td>
</tr>
<tr>
<td>2008</td>
<td>1.96 ± 1.03</td>
</tr>
<tr>
<td>2009</td>
<td>2.26 ± 1.27</td>
</tr>
<tr>
<td>2010</td>
<td>2.14 ± 0.86</td>
</tr>
<tr>
<td>2011</td>
<td>2.43 ± 1.18</td>
</tr>
<tr>
<td>2012</td>
<td>2.22 ± 0.56</td>
</tr>
</tbody>
</table>

2. **Effect of Rainfall on the $^7$Be Deposition Flux**
   It has been reported in many previous studies that rainfall (amount and duration) plays an important role in the deposition of $^7$Be. This study’s attempt to determine the effect of rainfall on the deposition flux, using the $^7$Be measurements and the size of the filter paper (57"x46") used in the collection of samples, found an anti-correlation (r = -0.57, with P < 2E-06). All of the $^7$Be deposition fluxes, except for 2, were below 5x10$^2$ Bq m$^{-2}$ s$^{-1}$. This differs from the results of studies conducted by Doering and Akber, 2008 in Brisbane, Australia who found positive correlations. Similarly, Chao et al., 2012 in Taiwan, although they did not get a strong correlation, they also generated a positive one. The uncertainty of the generated correlation will be one of the major items which will be investigated in the next phase of the study.

**CONCLUSION:**
At this initial stage of the study, results showed that $^7$Be values measured concurrently with the radionuclides of interest to the CTBTO in IMS RN stations has the potential to be used for generating behaviour profiles of the radionuclide significant for radiocological studies.

**FUTURE WORK:**
1. Collaborate with meteorological expert(s) for in-depth analysis of the $^7$Be profiles generated by this initial phase of the study.
2. Explore the possibility to expand the study area to include other IMS stations' $^7$Be data with close proximity to the Philippines.
3. Explore and discover additional relevant and useful information from the bigger data set.
4. This phase of the study and all future work is undertaken with the intent to publish.

**REFERENCES:**

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2. Mr. Martin Kathleen of DCC (Capacity Building and Training Section of the CTBTO), for providing direction and technical advice.
3. Ms. Leona J. Pulido, for facilitating the acquisition of meteorological data from PAGASA.

**PHOTOGRAPHS:**
- Figure 1: Temporal pattern of $^7$Be activity concentration.
- Figure 2: Temporal pattern of $^7$Be with Temperature.
- Figure 3: Temporal pattern of $^7$Be with Humidity.
- Figure 4: Seasonal Variation of $^7$Be Deposition flux.
- Table 1: Summary of $^7$Be activity concentrations for 2007-2012.
- Table 2: Summary of correlation coefficient (r) for $^7$Be concentrations and meteorological parameters.
- Table 3: Summary of correlation coefficient (r) for $^7$Be concentrations and meteorological parameters.

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