



Measurements of reactive iodine species at Mace Head and Mweenish Island, Ireland

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Recent field and laboratory studies are indicating a great relevance of reactive iodine in new particle formation processes. Since particles in the marine atmosphere affect the microphysical properties of clouds, they have a potential impact on climate. The presented measurements have been performed in the framework of the MAP (Marine Aerosol Production) project. Objective of MAP was to quantify the key processes associated with primary (PMA) and secondary marine aerosol (SMA) production from natural sources

Measurements of reactive iodine species (RIS) are rare and most of them have been conducted at Mace Head Research Station, Ireland. Thus it is important to study how representative the results from Mace Head are.

In summer 2007 measurements of RIS using differential optical absorption spectroscopy (DOAS) have been performed not only at Mace Head research station but also at Mweenish Island. Mweenish Island is located about 6 km south-east of Mace Head. The location was chosen, because it has a greater potential in terms of particle formation than Mace Head. The area is characterized by multiple source regions in all wind directions except for the northerly sector.

A long path DOAS instrument was set up at each site allowing simultaneous measurements at both sites. While at Mace Head molecular iodine and iodine oxide (IO), could be detected, at Mweenish only IO could be identified above the detection limit.

The two sites show different temporal characteristics in terms of the observation of RIS, which is due to different seaweed sources. While at Mace Head mainly seaweed of the type "laminaria hyperborea" is located along the light path, at Mweenish a variety of "laminaria" species is found.

A comparison of results from Mweenish and Mace Head will be presented. The time series of IO have been compared and the influence of wind direction, wind speed and tidal height on the observed mixing ratios was studied.

Additionally, two passive DOAS instruments using scattered sunlight as light source were set up at Mweenish Island to study the vertical distribution of RIS. While iodine dioxide and molecular iodine could not be detected, IO was observed showing a strong vertical gradient. The results of the passive DOAS instruments will also be presented.