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A new insight into the particulate iodine in the marine boundary layer

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Especially within the last few years the role of iodine in the lower troposphere has received increasing attention. In addition to the potential to affect the atmospheric oxidation capacity in a variety of ways such as catalytic destruction of ozone, the importance of iodine in the natural new particle formation (via secondary gas-to-particle conversion) in the marine boundary layer (MBL) is responsible for the increased interest and is motivated by the role of marine aerosol particles in the global radiation budget. One goal of current research activities is the identification and quantification of natural particle formation processes in the MBL. Although some progress has been made in recent years, the chemical species, reaction cycling and evolution of particulate iodine are still poorly understood, which in turn hinders our knowledge of the marine new particle formation processes. Here we will present results from recent field campaigns carried out at the Mace Head Atmospheric Research Station on the west coast of Ireland. The speciation of particulate iodine is performed by a newly developed precolumn derivatization and solid phase extraction preseparation method in combination with liquid chromatographic/mass spectrometric determination. The diurnal and seasonal variation as well as the cycling of different iodine species in the marine aerosols will be discussed. Furthermore, the linkage between gaseous reactive iodine species and particulate iodine will be presented.