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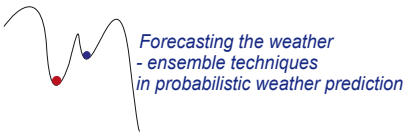

Estimation of fractional cloud cover from all-sky digital images at sea.

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Accurate estimation of cloud fraction is critical for the quantitative computation of surface short wave and long wave solar radiation at sea. Today science advanced to a point when we can engage information about cloud types in the analysis of solar radiation considerably extending the abilities of routine observations of cloud fraction taken visually. This is particularly important under overcast conditions frequently associated with the mixed cloud types and, therefore, optical thickness of the cloudy atmosphere. Our work is based on visual observations and in-situ measurements carried out in the Atlantic Ocean during 2007 - 2010. Visually observations of fractional cloud cover and types were performed according the WMO guidelines with determination of the fraction in octa and types according to a standard notation. Alternatively, during the cruises, we performed digital imaging of the sky sphere using digital camera with a wide-angle lens of the “Fisheye” type. In this talk we present (i) the experimental design of a system for automatic imaging of the sky sphere, (ii) technique for the digital analysis allowing for quantitative estimation of cloud characteristics by the retrievals of images and (iii) comparative assessment of the visual methodology and that one based on digital imaging. Of a special interest is the development of new metrics available from digital imaging and based on the analysis of 8-bit pixels in RBG channels of images. Using these parameters retrieved from the sky images we improve the accuracy of computation of cloud dependent radiative fluxes at sea surface.