EMS Annual Meeting Abstracts
Vol. 8, EMS2011-867, 2011
11th EMS / 10th ECAM

Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

First observations of the polarization of urban sky glow

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Rayleigh scattering of collimated sunlight by atmospheric molecules both gives the sky its blue color, and produces a strong linear polarization pattern at 90 degrees from the Sun's position. The sky glow produced by light pollution from urban light sources, in contrast, has generally been assumed to be almost unpolarized, both because the sources of light pollution are uncollimated, and because of additional scattering from aerosols. We obtained sky polarization measurements by taking multiple images using a linear polarizer and a research grade camera, and have observed linear degree of polarizations of up to 9% for an urban location on a moonless night in Berlin. We also show that the polarization pattern from searchlights stands out strongly from the polarization pattern of the sky glow, and is easily observed many kilometers from the base of the search light itself. We discuss the ways in which upward directed unpolarized city light may result in polarized sky glow, and address the limitations of our current measurement technique.