



3D-Cloud Morphology and Motion from Dense Stereo for Fisheye Cameras

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Sky imager cameras provide hemispheric images with high spatial and temporal resolution and are commonly used to derive cloud cover and cloud type. A camera pair in a stereo setup in combination with a dense stereo reconstruction technique is used to recover quite complete and consistent cloud morphologies with high geometric complexity over a large part of the hemispheric field of view.

A second stereo-camera-pair allows to reconstruct closed cloud boundaries. The technique is efficient and can be automated for an operational use. A validation of a large dataset validated against lidar-ceilometer and cloud radar observations shows good agreement.

In combination with Optical Flow methods a cloud motion analysis is conducted and the derived velocities and directions are compared to wind-lidar observations.

Products are cloud morphology, cloud height, size, cloud base height and cloud motion, which can provide useful information regarding radiative closure studies and cloud dynamics.