



Atmospheric monitoring using a ground-based infrared camera

S. Smith, R. Toumi

Space & Atmospheric Physics Group, Imperial College London, UK
(stephen.m.smith@imperial.ac.uk)

A small, durable ground-based infrared (IR) camera has been deployed at Imperial College London in order to continuously monitor cloud cover and atmospheric conditions. The camera has a spatial resolution of 240x320 pixels over an adjustable field of view of up to 80°, and a sensitivity of 80mK. This makes it a promising candidate for use as an automated cloud observation station which could be deployed in a range of locations, providing valuable information for climate studies and weather forecasting.

In order to reliably identify cloud cover and distinguish between different cloud types, a number of difficulties are to be overcome. First, the camera needs to be able to detect all cloud types which are visible to the eye and thus currently recorded, including cold, optically thin cirrus. Then the observed emission from water vapour, ozone and aerosols in the atmosphere needs to be accounted for, including its variation with zenith angle. A clear set of defining properties for each cloud type must then be drawn up in order to categorise the observed cloud cover. One such property which is readily available from the camera data is brightness temperature, allowing an initial categorisation of results into low, middle, and high level cloud due to its strong dependence on altitude.

This contribution will address the above issues, and will present data collected as part of the Convective Storm Initiation Project (CSIP) in July 2005.