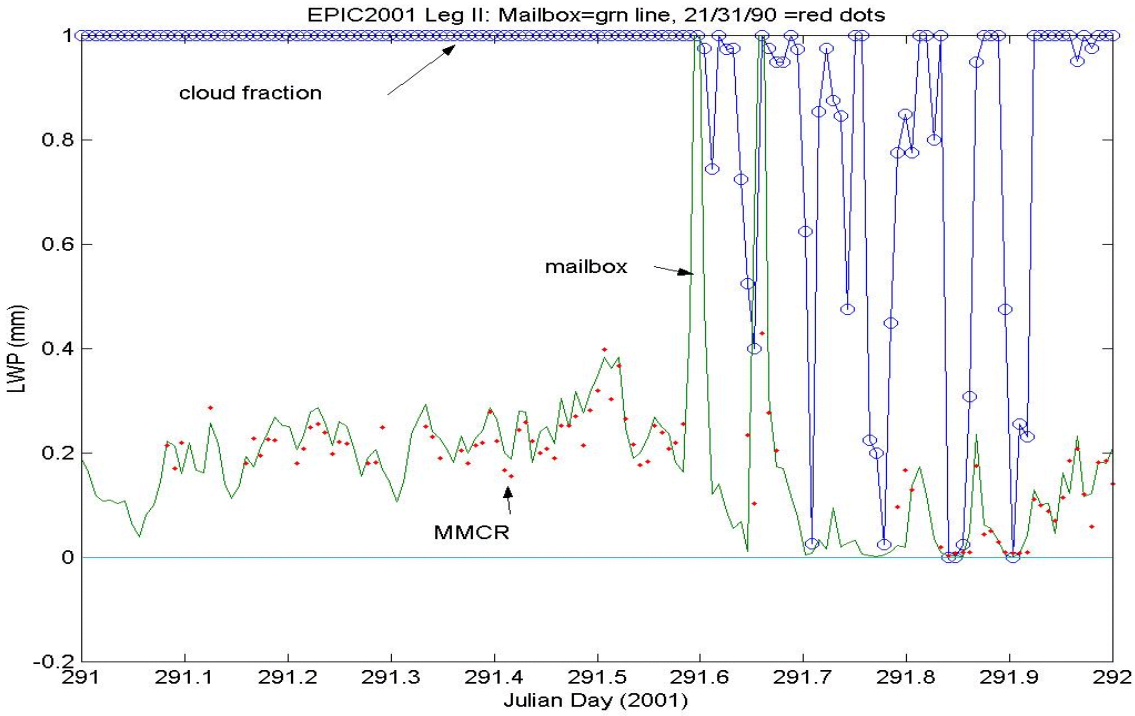
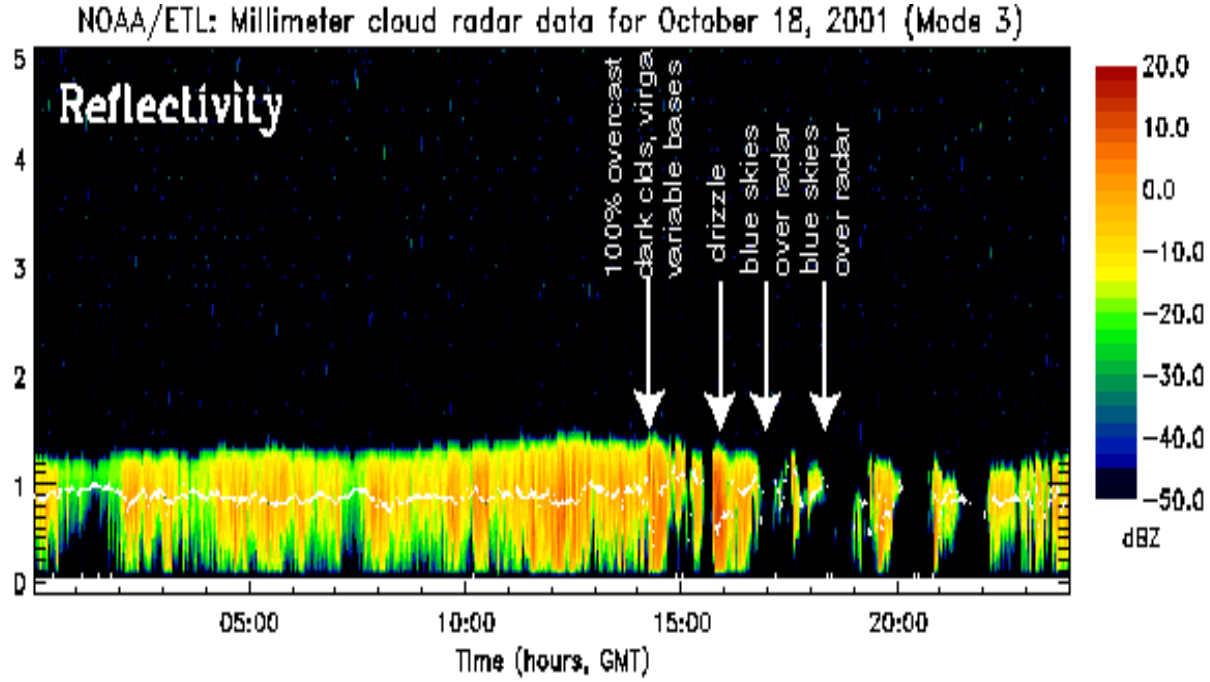
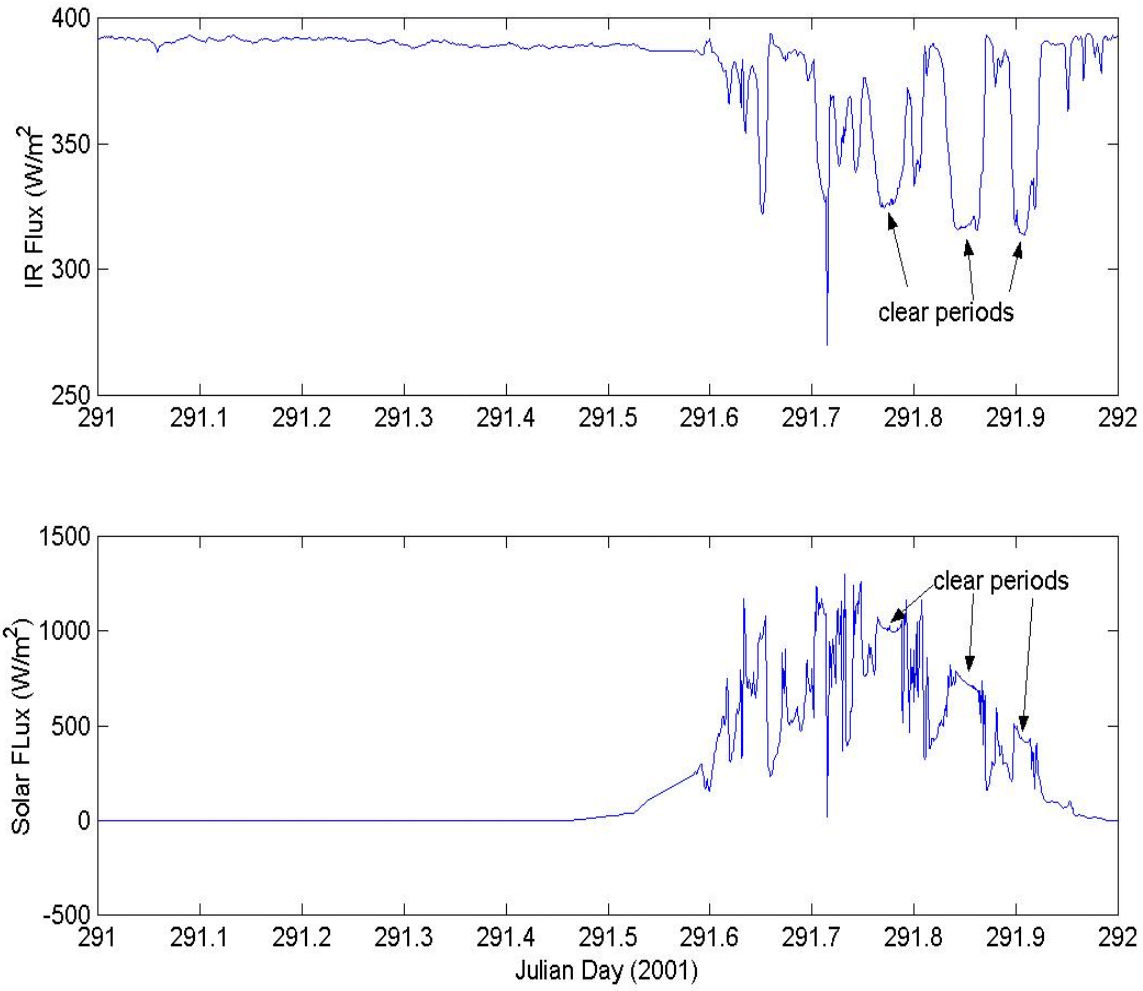
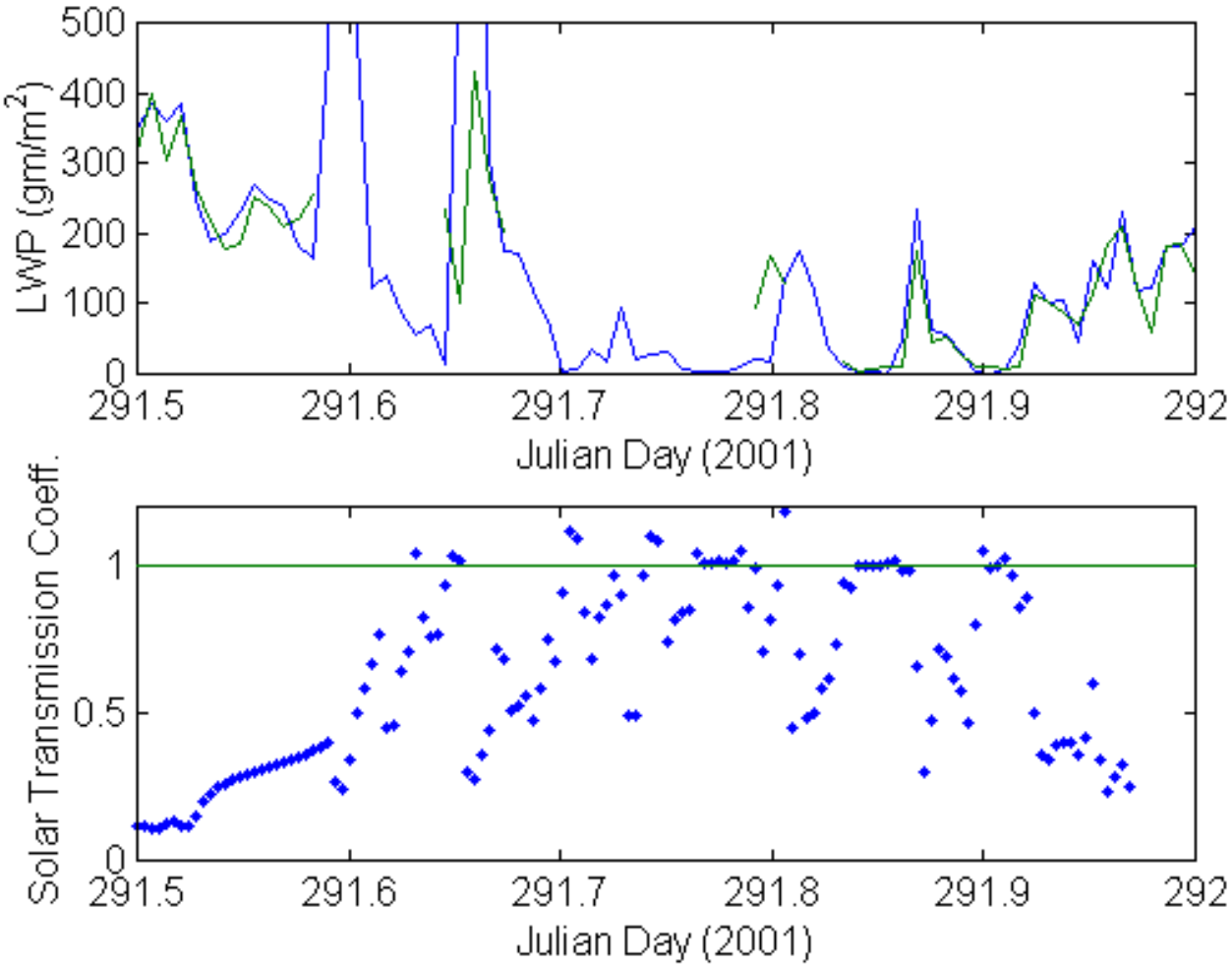




Stratocumulus cloud characteristics on Oct. 18, 2001. Upper panel: total liquid water path (LWP) from two microwave radiometers (green line and red dots) and cloud fraction from a ceilometer (blue circles). Lower panel: cloud radar backscatter intensity (color contours) and ceilometer cloud base heights (white dots). Daytime clearing was triggered (?) by 2 short drizzle events. Note the reduction of cloud top height during the day (decreased entrainment?).



Downward radiative fluxes (upper panel: IR; lower panel: solar) on Oct. 18, 2001. The difference in IR flux for clear vs cloudy conditions is about 70 W/m^2 (so-called maximum cloud radiative forcing). The spikes in solar flux that exceed the clear sky flux occur when the sun is unobscured and additional radiation is reflected from nearby clouds.



Time series of liquid water path (upper panel) and solar transmission coefficient, Tr (ratio of measured to modeled clear sky solar flux) for daylight hours on day 291 (Oct 19, 2001). Clear periods (small LWP) have Tr on the order of 1.0. The spikes in LWP at 291.59 and 291.66 are probably artifacts due to drizzle wetting the antennas.

These three sets of figures above give an example of remote sensing of cloud properties from legII on EPIC2001. The liquid water path in the cloud is measured by microwave radiometer (redundant 2-channel and 3-channel systems were used). From the cloud radar we can determine the droplet size as a function of height in the cloud. These can be related to microphysical/dynamical processes within the clouds. The radiative transfer properties are also related to the microphysical properties: the bulk transfer properties (i.e., fluxes emerging from cloud base) are measured at the surface. Daytime clearing was observed almost every day in the stratocumulus region even though the clouds were often 300-400 m thick at night. The diurnal cycle was much stronger that is typical off California (beyond the coastal influence). Because of this clearing, the net heat flux to the ocean averaged about 80 W/m^2 [in contrast to a net *cooling* of 30 W/m^2 observed at 10 N on legI]. In this case the clouds are having a smaller than expected effect on the surface heat budget of the ocean.