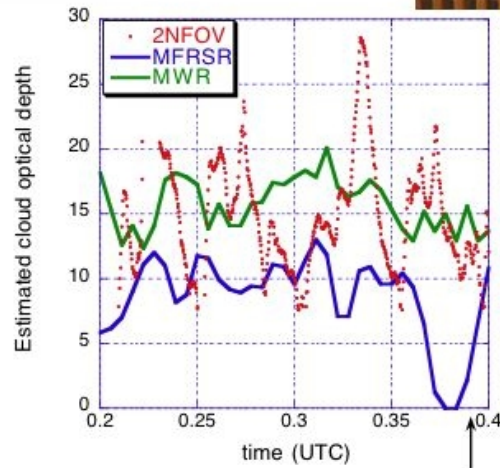
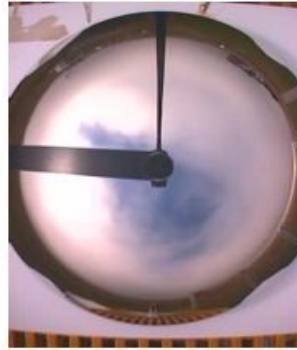


Cloud measurements at the ARM Mobile Facility at Point Reyes National Seashore



Members of the NASA/GSFC Climate and Radiation Branch joined the Point Reyes field campaign and deployed the ARM passive two-channel Narrow Field-Of-View (2NFOV) radiometer in June 2005. Point Reyes is ideal for our work because of the high abundance of clouds. The upper-right image is a sky-image snapshot taken at 00:22:30 UTC on June 21, and the graph below is the estimate of cloud optical depth over a 12-minute period. (The arrow at the lower-right corner indicates the time of the sky image snapshot.) The retrievals from 2NFOV (red dots) captures local rapid changes in 3-dimensional cloud structures at the natural time scale of clouds, made possible because of the one-second sampling resolution of 2NFOV measurements. The other two retrievals are from a Microwave Radiometer (MWR) (instrument on the right in the upper left image) and a Multi-Filter Rotating Shadowband Radiometer (MFRSR). Marine stratus clouds are one of the most prevalent clouds on Earth, and are an essential element in our climate system. To further our understanding of the interactions of this type of cloud and radiation, the Atmospheric Radiation Measurement (ARM) Mobile Facility (AMF) has been deployed since May 2005 at the Point Reyes National Seashore in California. This field campaign will be collecting valuable measurements until September 2005. [Click here to view photographs.](#) The AMF is located in the small patch of trees in the center. What quantity of clouds do we expect to obtain in order to better model cloud-radiative interactions? Cloud optical depth is one of the most important optical properties and vital for any cloud-radiation parameterization. If we cannot confidently and unambiguously measure it, we will never be able to check the validity of any cloud model. To estimate cloud optical depth from ground-based observations, members of the NASA/GSFC Climate and Radiation Branch pioneered an algorithm to retrieve cloud optical depth from the ARM passive two-channel Narrow Field-Of-View radiometer, called the 2NFOV (instrument on the left in the upper left image). The 2NFOV radiometer views straight up, and measures downward radiance at the red and near-infrared wavelengths. Since vegetated surfaces reflect substantially different amounts of radiation in these two wavelengths, we can extract information on cloud optical depths from the resulting difference in radiances between these two channels. This algorithm works not only for overcast clouds like stratus, but also for broken clouds like cumulus.

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