23 July 2002 Mission Report

Forecast:

The forecast called for redeveloping maritime convection NE of Florida, with cloud tops getting to 12 to 14 km. We expected suppressed convection over the peninsula, with some late sea-breeze cells developing over the west coast.

Mission Summary:

The initial plan to sample the maritime convection was scrapped almost immediately after take off, as the maritime system NE of Florida never really got up-to-speed. The high-flying aircraft made early traverses to the east of the peninsula for a TRMM overpass. For the remainder of the mission, the ER-2, WB-57F, Proteus, Citation, and Twin Otter flew NE-SW-oriented legs over the western ground site, sampling outflow cirrus from convection near Lake Okeechobee. The P-3 was flying to the north of the rest of the planes, in the Ft. Myers area. This flight should provide useful *in situ* measurements for remote-sensing cloud retrieval algorithm development.

Aircraft Summaries:

Citation

The Citation took off at 1852Z. The crew flew toward the western ground site at about 30 kft and began running NE-SW legs, ascending to 37 kft and sampling light anvils on the north end of the track. They gradually descended to 29 kft and then spiraled up over the western site to 37 kft, sampling some good clouds on the ascent. Later they spiraled down to 24 kft, at which point the cloud system began breaking up and they returned to base.

ER-2

The recent problem with the ER-2 flaps appears to be fixed now. The ER-2 initially flew a TRMM overpass over the eastern ground site and off the east coast of the peninsula. Most of the remainder of the flight was spent along NE-SW-oriented legs that passed over the western ground site near the south end, and over Lake Okeechobee and near the east coast on the north end. Six dropsondes were launched through a variety of cloud conditions. One notable observation was a significant gravity-wave event over a cumulonimbus cloud near the lake.

P-3

The P-3 took off about 1830Z and flew some NE-SW legs north of the western ground site (in the Ft. Myers area). They later flew some legs oriented NW-SE just off the west

coast in the Ft. Myers area. Some aircraft issues brought them back to base around 2200Z.

Proteus

The Proteus took off at 1816Z and flew over the eastern ground site for the TRMM overpass. They lined up on the NE-SW line over the western ground site for the remainder of the flight, in coordination with the high fliers. En route to KWNAF, they flew over the Gulf to the NW of Key West and then landed about 0000Z.

Twin Otter

The Twin Otter took off at 1929Z. They took off flying almost due north toward the western ground site at 5 kft. They descended to 3 kft (below cloud base) and then climbed back up to 4 kft (just in cloud base) near the western ground site. The remainder of the flight was essentially NE-SW-oriented legs centered over the western ground site. Several legs were flown at 5 and 7 kft, followed by a series of legs at 11.5 kft nominally designated for radiation experiments. The Twin Otter returned to base at 2353Z. There were some instrument difficulties associated with heat build-up in the plane while sitting on the tarmac awaiting its late departure time.

WB-57F

The WB-57F took off at 1832Z and passed over the eastern ground site and off the east coast for the TRMM overpass. The remainder of the flight was spent on NE-SW-oriented legs passing over the western ground site. The south end of the flight was SW of the western site over the Gulf; the north end was over Lake Okeechobee. A number of altitudes were sampled on the various legs, and there were many brief encounters with their own contrail. The tropopause was described to be “very round” on this flight, and there was a significant gradient in the tropopause height between about 45 and 51 kft. The WB-57F returned to base at 0017Z.