

6.4 Special Studies

The previous two sections have discussed some of the information that can be gained from operating routine monitoring networks. However, there are other approaches to gaining a fuller understanding of the pathways and processes between emission and deposition, namely special studies carried out with intensive, more detailed observations over limited geographical areas and shorter periods of times. These studies have often involved aircraft to obtain data within the atmosphere's surface mixed layer and in clouds. Some of the major studies carried out in the last few years are discussed in Report 2F-I although in most cases the data analysis is far from complete. Some of the emerging findings from these studies include a) the role of clouds in speeding up the production of sulfuric acid from sulfur dioxide, b) the role of cloud nucleation as an important in-cloud sulfate scavenging mechanism, and c) the observed acidity of cloud water, implying a mechanism that produces additional acid in the clouds. The implications of some of these results have been discussed in Chapter 4.

6.5 Single Station Sector Analysis

As pointed out in Section 6.4.1 there is a strong geographical concurrence of the regions of highest sulfur deposition with the emission source regions. This relationship can be further investigated by analyzing the data from monitoring stations according to wind sector. The principle is very simple. At a given station the surface wind, or if available the wind at a more representative transport height (say, one or two kilometers above the ground), is classified according to wind direction (usually by the eight compass points). The air or precipitation concentrations are then stratified into these sectors and the mean value, frequency distribution or other