**Table 3.3. Comparison of observed and computed 6-hour precipitation for the period 2 p.m. – 8 p.m., 22 December 1955 over Blue Canyon, California, test area**

| | *Leg* | | | | | | | | | | *Average* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | |
| *Horizontal length of leg (nm)* | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.5 | |
| *Cumulative length (nm)* | 5.2 | 10.4 | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 | 41.6 | 46.8 | 50.3 | |
| *Elevation at end of leg (m)* | 180 | 366 | 543 | 707 | 978 | 1 244 | 1 414 | 1 689 | 2 060 | 2 448 | |
| *Observed precipitation (mm)* | 3 | 6 | 13 | 25 | 38 | 46 | 55 | 64 | 67 | 65 | 37 |
| *Machine-computed precipitation 1* | 0 | 14 | 40 | 44 | 55 | 66 | 54 | 60 | 67 | 72 | 46 |
| *Machine-computed precipitation 2* | 1 | 17 | 44 | 45 | 56 | 66 | 55 | 59 | 67 | 69 | 47 |
| *Hand-computed precipitation* | | | | | | | | | | 73 | 49 |

Notes: Elevation at beginning of first leg = 61 m.
Machine-computed precipitation 1 used spacing of streamlines by a method developed by Myers.
Machine-computed precipitation 2 used spacing of streamlines between surface and 350-hPa nodal surface (assumed), along any vertical, proportional to their spacing at inflow.
Hand-computed average precipitation over leg 10 and legs 1–10 based on the same spacing of streamlines as machine-computed precipitation 2.

upward from this point. The saturation mixing ratio on this moist adiabat is about 6.22 g/kg at 703 hPa and about 5.76 g/kg at 680 hPa. The mixing ratio values on the 875-hPa streamline at the lower and upper precipitation trajectories are found in the same way.

For the 850- to 875-hPa layer, $\overline{V}$ is then seen to be 44.2 kn, $\Delta P$ = 1105 kn mb, $\overline{W}_1$ = 9.13 g/kg, $\overline{W}_{LT}$ = 6.34 g/kg for the lower trajectory, and $\overline{W}_{UT}$ = 5.86 g/kg for the upper trajectory. The decrease in mean mixing ratio of the layer from inflow to lower trajectory, $\Delta\overline{W}_{LT}$ = 2.79 g/kg and to the upper trajectory, $\Delta\overline{W}_{UT}$ = 3.27 g/kg. For the layer, the value of $\overline{V}P\overline{W}$ is 3 083 nmi/hour hPa g/kg between inflow and lower precipitation trajectory and 3 613 nmi/hour hPa g/kg between inflow and upper trajectory.

After values of $\overline{V}P\overline{W}$ are computed for all layers for all trajectories, values for each trajectory are summed and multiplied by 0.0612 nmi hour (6 hour)$^{-1}$ kg/g mm/hPa to obtain values in mm nmi$^2$ (6 hour)$^{-1}$. In Table 3.1 these values are 2 193 for the lower trajectory and 2 447 for the upper trajectory. Division by the areas over which these volumes fall gives average depths for those areas. Since unit width is assumed for Figure 3.6, any such area is numerically equal to the sum of the lengths of the legs between inflow and a given precipitation trajectory. For the lower trajectory this is the sum of the lengths of legs 1–9, or 46.8 nmi$^2$, which makes the 6-hour average depth over those legs 47 mm. For the upper trajectory, the volume falls over legs 1–10, or 50.3 nmi$^2$, giving a 6-hour average depth of 49 mm. The volume that falls on leg 10 alone is the difference between the volumes under upper and lower trajectories, or 254 mm nmi$^2$ (6 hour)$^{-1}$. This is distributed over 3.5 nmi$^2$, which makes the 6-hour average depth 73 mm.

#### 3.2.3.7 Comparison of results

The above procedure has been computerized to facilitate complete computations for numerous areas and soundings. Another computerized version of the orographic model is somewhat more sophisticated than the one just described. Whereas in the example model the height of the nodal surface was assumed and an approximate method used for spacing streamlines at the outflow over a mountain crest, this second computer model uses a nodal surface and streamline spacing based on physical laws of air flow (Myers, 1962). The outflow approximations used in the above example give results comparable with those of the more sophisticated model. Table 3.3 compares the results yielded by the two computerized models for each of the ten legs for a 6-hour period and by the manual application just described for the tenth leg.

The so-called observed precipitation used in the comparison of Table 3.3 refers to the orographic component only. Ordinarily, this would be obtained by subtracting from the observed total precipitation for each leg the precipitation measured in the flat valley upwind of the test area