horizontal dispersion by a Monte Carlo technique, using repeated random perturbations of the movement of the pollutants about the mean flow.

As in the case of horizontal diffusion, the treatment of vertical diffusion and mixing height varies greatly among the models. Most models assume a uniform concentration in the vertical below a specified height because pollutants are very often uniformly mixed from the surface to the top of the mixed layer (usually several hundred to 2000 meters deep). In some models, the mixing height is constant in time and space (MOE) or it may vary daily, monthly, seasonally and/or spatially (RCDM-3, UMACID, AES, ENAMAP, MEP). The CAPITA model treats vertical diffusion as a random vertical perturbation. The ASTRAP model uses a vertical diffusivity which may be varied with time and height. Mixing heights (the top of the surface mixed layer) and noctural ground-based inversions are simulated by zero vertical diffusivity at the appropriate height above the ground.

3.3 Conservation of Mass in the Models - Use of the Lagrangian or Eulerian Framework

LRT models conserve the mass of the pollutant, be it sulfur or nitrogen, by solving the equation of the continuity of mass. When the equation is solved in a co-ordinate system that moves along with an air parcel, the model is said to be Lagrangian. If the conservation of mass equations are solved in a fixed co-ordinate system through which air masses are advected and diffused, the model is said to be Eulerian. Lagrangian models relate relatively easily to the processes going on in a specific air parcel, but can be difficult to relate to observations in a fixed sampling network. On the other hand, the formulation of the processes occurring in the moving air mass is more complex in an Eulerian than in a Lagrangian framework, but output can be more readily compared with observations. In addition, important statistics such as frequency of precipitation are derived from Eulerian (point)