modified at the JSPC to account for receiver elevation which can effect the resulting locations where there are large receiver elevation differences.

The distance and depth dependent travel time tables were determined using a structural model that consists of a local Caucasus crust over an IASPEI91 mantle (see figures 3 and 4). The crustal model is a Russian Kislovodsk model that is used in the preparation of their bulletins from that region. By and large, analysts were encouraged to use only the first arriving P and S waves in the locations regardless of the particular phase and a travel time table was constructed of first arriving P and S times to aid in this (in this information product phases labeled simply as **P** or **S** are defined as being the first arriving phase). In some cases it was necessary to use a later arriving phase, such as L_g, especially in situations where the first arriving S-wave was hard to read.

The overall location and association procedure was driven by a computer script that kept an audit trail on everything the analyst did and allowed the process to be easily restarted. The overall procedure is described below.

- A simple time window-based algorithm was used to group together P and S arrivals into a candidate association for a single event.
- Waveforms and arrival flags from the five network stations were displayed in an interactive window, automatically time scrolled to the event and ordered by increasing P-time. The analyst could then change arrival times, relabel them, delete and add them and/or change the arrival grouping parameters and re-establish a candidate association.
- The PDE catalog was automatically searched for potential event associations with the candidate group of arrivals. Events which fell within the arrival time residual thresholds were saved in a temporary database and the associations and time residuals were displayed in both text and graphic forms.
- The analyst checked and possibly changed time uncertainty measurements. In addition the analyst made amplitude and period measurements on the P-wave when possible. This measurement was made on 0.8-5.0 Hz bandpass filtered waveforms by measuring the largest peak to peak oscillation in the first 5 seconds after the first P-wave onset.
- In cases where there were enough arrivals to provide a reasonable independent location (at least four arrivals from at least two stations with at least one P and one S arrival), the analyst could execute **LocSAT** which, upon completion, placed the new location along with the location error parameters into the temporary database and displayed the errors and time residuals. In addition to the phases used in the location, all other secondary phases were automatically displayed on the waveforms to aid in the location evaluation.
- The analyst could change/repick arrivals, regroup the arrivals, reassociate using the PDE catalog, change **LocSAT** execution parameters (such as constraining the depth) and rerun **LocSAT** as many times as desired with all results stored in the temporary database.
- Once the analyst was satisfied with the results, the location and/or association could be archived into the permanent database. At most one PDE association was stored and one JSPC location per event. Events which were not locatable and which did not have PDE associations could be skipped.
- The analyst would go back to the first step to group the next set of arrivals and repeat the process.