$z(x_m, t_n)$ it is not necessary to compute first the field for $t < t_n$ as in the conventional finite difference approach. This feature makes the method very suitable for parallel simulation of the 1-D diffusion system.
The method has been implemented on a Parsytec Transputer system, consisting of 12 transputers. The state $z(x,t)$ is computed for an arbitrary set of points (x_m, t_n) and for some specified boundary conditions and initial conditions. After the computation the state $z(x,t)$ can be shown in a 3D-plot.

7. Application of High Performance Computing in Turbulent Flow Simulation

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The numerical simulation of transitional and fully developed turbulent flow forms a subject of intensive research. Two different approaches can be distinguished: direct numerical simulation (DNS) and large eddy simulation (LES). In DNS the flow is simulated on a sufficiently fine grid in order to accurately resolve the wide range of length scales encountered in turbulent flow. In LES the spatially filtered Navier-Stokes equations are considered, and a time-accurate treatment is given of the resolved length-scales, whereas the effects of the (unresolved) small scale phenomena are modeled with so called subgrid-models. By direct numerical simulation of flow in simple geometries, the 'quality' of different proposals for subgrid models can be assessed. We will illustrate this approach for compressible flow over a flat plate and the compressible mixing layer.

In these simulations the full or modeled Navier-Stokes equations are solved time-accurately which requires the use of very large computer resources. Requirements on these resources will be presented. Both calculation time and memory are limiting factors. Therefore, the application of parallel processing to these simulations is considered a powerful tool to achieve the necessary progress in the subject of simulation of turbulent flow. The strategy of parallelisation will be sketched and demonstrated. Requirements on data structures (and algorithms) will be presented. on parallel computers.

8. An Optical Back-plane: from Model to Reality

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The principle of an Optical Back-plane are demonstrated. Modelling originates from the simulation of an Optical Data Distributor System. Verification of the properties of the Optical Data Distributor System is accomplished by a real-time analysis of the system response with the assistance of a Light-wave Component Analyser, in which variables are represented by the individual properties of lenses, mirrors, gratings and prisms.
The characteristic properties of the non-ideal coupling effects and of the influences of the Electro Optic transducer are shown. A prototype of a new generation of Opto Electronic Integrated