

## Serie 10

*Remark: Programs shall be executed on altix!*

**Exercise 1** Complete the file `jacobi.c` by coding the Jacobi method for solving the linear system  $A\mathbf{x} = \mathbf{b}$  in single precision (type `float`). The matrix  $A$  is sparse, stored in a Morse data structure (cf. Exercise 1, Serie 6, option 2.); the stopping test is done on the residual divided by the right-hand-side norm. All the components of the right-hand-side are equal to 1, the diagonal entries of the matrix are equal to 10; each line of the matrix contains five times the number  $-1$  with a random distribution. The order of the matrix will be  $N = 1240000$  and the value for the stopping test equal to  $10^{-6}$ . Then, parallelize the sequential code with OpenMP directives and measure the CPU times on  $p = 1, 2, 4, 8, 16$  processors.

**Exercise 2** Use the same file as in the preceding exercise for programming the asynchronous Gauss-Seidel method with the help of OpenMP directives. Measure the CPU times like in the preceding exercise. Comment the results.