

## **The Schur complement method and solution of large-scale geophysical problems**

Vladislav Aleksandrov, Henri Samuel

The Schur complement domain decomposition method is implemented into a linear solver to achieve high performance on parallel computers with distributed memory. One of the main advantages of the method is its robustness and its scalability, even for cases with strongly varying matrix coefficients. Two types of parallelism can be exploited, namely, solving independent subdomains in parallel and using multiple processors per subdomain. Each subdomain is treated, coupled with the interface subdomain, in order to find the Schur complement matrix. In addition, as each subdomain is processed independently, the optimization of the memory usage is facilitated.

We present the algorithm and the program which can be used in many geophysical simulations where more system demanding computations are required.