

# Domain Decomposition of Large Problems on Cray T3E

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## Abstract

The solution of large problems on parallel computers with distributed memory or on computer networks requires the decomposition of data into subsets that fit in the single memories. Most graph-based partitioners necessitate the whole dependence graph and limit, therefore, the manageable problem size if no common address space is available. In this paper, we propose two decomposition methods that are able to treat large problems in spite of memory limitations. The first method uses a line-wise representation of the domain to compute a coordinate section. The parallel version of the Balanced Hypersphere Tessellation (BHT) works on distributed data sets and allows a growth of the problem size proportional to the number of processors (or to the available memory in heterogeneous networks). Both algorithms are applied to multi-level methods.