

Implementation of parallel boundary integral method on spherical bubble dynamics using shared memory computer

ABSTRACT

The boundary integral method is employed to model the dynamic behavior of the 3D spherical bubble. It has been solved on the Sequent Symmetry S5000 SE30 computer to better understand the opportunities and challenges the parallel processing presents. Analyses of the parallel performance of the approximation to the potential at certain external points as well as the normal derivatives of the potential on the surface of the bubble were generated using linear representations of the surface and the functions. In these calculations, 4, 6 and 8 Gauss points were used in the integration on 4, 8, 16 32 and 64 segments. Results from this study demonstrate that parallel computing greatly conserves the computational effort and is shown to be an effective tool for several problems related to bubble dynamics.

Keyword: Boundary integral method; Shared memory; Bubble dynamics; Parallel computing