1056-65-1959 **Chensong Zhang*** (zhangcs@psu.edu), Math Dept, Penn State Univ, State College, PA 16802, and **Long Chen** (chenlong@math.uci.edu), Department of Mathematics, University of California at Irvien, Irvine, CA 92617. *A COARSENING ALGORITHM ON ADAPTIVE GRIDS BY NEWEST VERTEX BISECTION AND ITS APPLICATIONS.*

An efficient and easy-to-implement coarsening algorithm is proposed for adaptive grids obtained using the newest vertex bisection method in two space dimensions. The coarsening algorithm does not require storing the binary refinement tree explicitly. Instead, the struc- ture is implicitly contained in the special ordering of triangular elements. This not only reduces the memory usage and CPU time, but also simplifies the implementation. Numerical experiments demonstrate that the proposed coarsening algorithm is very efficient when applied for multilevel preconditioners and mesh adaptivity for time-dependent problems. (Received September 22, 2009)