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**Development of a Three-Dimensional, Unsplit, Time Dependent
Perfectly Matched Layer For Elasto-Dynamic Analyses.**

A time dependent, three-dimensional finite element approach to the development of a perfectly matched layer for numerical calculations of surface wave radiation in a half space is presented. The development of this new element requires the coupling of a system of linear, second-order, partial differential equations which describe elastic wave propagation into a single weak-form (Galerkin) wave equation from which the characteristics of a composite finite element matching layer were derived. Time marching is done via a one step explicit algorithm for solving primary variables without matrix inversion or iterative sub steps. This work develops a methodology for finite element analysis of three-dimensional, semi-infinite, time-dependent elasto-dynamic problems.