	Laminated Cylindrical Shells	unsymmetric. Several authers have investigated the ability of the DCM in static and dynamic analysis of structures. For instance, DCM has been utilized in static bending analysis of shells of revolution such as cylinderical, spherical and conical [1-2] . Also application of DCM for free vibration analysis of thick plates have been reported by Wu [3]. Using first order shear deformation theory, fifteen first order partial differential equations are obtained which contain fifteen unknowns in terms of displacements, rotations, moments and forces [4]. Comparison of the results obtained by the DCM, shows very good agreement with the results of other numerical and analytical methods, while having less computational effort. One of the novelties of this paper is the use of the DCM for free vibration analysis of cylinderical shells for the first time. The results depict the capability of the DCM to be used as a numerical software in structural mechanics.
Patterson, Brandon	Localization of Vibrations in Nonhomogeneous Strings	It has been acknowledged by physicists a long time ago that propagation of vibrations in domains with complex geometry or material discontinuities is sometimes dampened without any visible obstacle. In particular, a vibration induced near irregular boundary may stay confined to a small portion of the initial domain. However, this effect of localization is very poorly understood and up to date has no rigorous mathematical explanation. In the present work we investigate vibrations of a nonhomogeneous string with a single material discontinuity. For such a model, we provide explicit formulas for eigenmodes of the corresponding differential operator and calculate the so-called localization coefficient, measuring the strength of confinement of an eigenmode to a particular portion of the entire string. Further investigation reveals that this localization coefficient can be asymptotically expressed as a simple function of the displacement of an eigenmode at the point of material discontinuity. Thus, in a non-homogeneous string described above one could measure the amplitude of a specific mode at the juncture point to determine directly its degree of localization, without knowing the corresponding eigenvalues.
Sambath, Krishnaraj	Computational methods for free surface flows	The fundamental equations of fluid flows are the continuity equation and Cauchy momentum equation. These governing equations by nature are coupled non-linear partial differential equations in space and time which makes it a difficult problem to solve. In particular, free surface flows have been among the hardest problems to solve as the domain of the problem is unknown apriori. To add one more layer of complexity, the entire system is immersed in electric field which adds to the rich physics of drop formation. This requires the Maxwell's equations be solved along with the now augmented fluid flow equations. Analytical solutions to such systems are almost never possible for most engineering problems. To tackle such situations, many computational methods have been developed. In this work, the use of a very robust Galerkin finite element method along with multi-order Adams-Bashforth adaptive stepping techniques to solve static and dynamic

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