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David Mora and Rodolfo Rodríguez, A piecewise linear finite element method for the buckling and the vibration problems of thin plates ... 1891
Todd F. Dupont and Itir Mogultay, A symmetric error estimate for Galerkin approximations of time-dependent Navier-Stokes equations in two dimensions ................................................................. 1919
Ramiro Acevedo, Salim Meddahi, and Rodolfo Rodríguez, An E-based mixed formulation for a time-dependent eddy current problem 1929
M. Asadzadeh, A. H. Schatz, and W. Wendland, A new approach to Richardson extrapolation in the finite element method for second order elliptic problems ................................................................. 1951
Kassem Mustapha and William McLean, Discontinuous Galerkin method for an evolution equation with a memory term of positive type 1975
Jiequan Li, Huazhong Tang, Gerald Warnecke, and Lumei Zhang, Local oscillations in finite difference solutions of hyperbolic conservation laws .......................................................................................... 1997
István Gyöngy and Nicolai Krylov, First derivatives estimates for finite-difference schemes ................................................................. 2019
Erwan Faou and Tony Lelièvre, Conservative stochastic differential equations: Mathematical and numerical analysis .................. 2047
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