

1154-65-984

JaEun Ku*, 401 Mathematical Sciences, Oklahoma State University, Stillwater, OK 74074. *Flux based finite element methods.*

In this talk, we present a new finite element method based on flux variables. In many applications, the flux variables are often the quantity of interest. To approximate the flux variable accurately and efficiently, one transforms the second-order equations into a system of first-order and approximates both the primary and flux variables simultaneously. While this indeed produces accurate approximations for the flux variables, the resulting algebraic system is large and expensive to solve. We present a new method approximating the flux variables only without approximation of the primary variable. If necessary, the primary variable can be recovered from the flux approximation with the same order of accuracy. We also consider the conservation of mass. This new approach can be considered as a reduced version of the standard mixed finite element methods. (Received September 12, 2019)