1145-35-2465    **Xinxiang Li** and **Thir R. Dangal\*** (`tdangal@alcorn.edu`), 1401 Highway 80 E, K122, Clinton, MS 39056, and **Bin Lei**. *Localized method of particular solutions with polynomial basis functions.*

The method of particular solutions (MPS) using polynomials as the basis functions has been successfully developed for solving a large class of partial differential equations. However, when a large number of collocation points are required, the above mentioned approach is not feasible since the resultant matrix is dense and ill-conditioned. This restriction is common for global methods. One of the alternative approaches is to employ the localized scheme in which only a small number of neighboring points are being used in the solution process. As a result, the resultant matrix of the localized method is sparse and thus can be solved efficiently. In this work, the localized method has been employed to extend the recently developed MPS using polynomial basis functions for solving large-scale science and engineering problems. Overall, the proposed approach is stable and highly accurate. Two numerical examples are presented to validate the proposed numerical method. (Received September 25, 2018)