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Reza Mollapourasl* (mollapor@oregonstate.edu), **Majid Haghi** and **Ruihua Liu** (rliu01@u Dayton.edu). *Localized meshfree method for pricing financial options under regime switching jump diffusion model.*

In this work, we consider European and American option pricing problems under regime switching jump diffusion models which are formulated as a system of partial integro-differential equations (PIDEs) with fixed and free boundaries. For free boundary problem arisen in pricing American option, we use operator splitting method to deal with early exercise feature of American option. For developing a numerical technique we employ localized radial basis function generated finite difference (RBF-FD) approximation to overcome the ill-conditioning and high density issues of discretized matrices. The proposed method leads to linear systems with tridiagonal and diagonal dominant matrices. Also, stability of the proposed method is discussed and the second order in time and space convergence rate are derived. Numerical examples are presented to illustrate the robustness and practical performance of the proposed algorithm for pricing European and American options. (Received February 03, 2018)