Numerical study of the RBF-FD level set based method for partial differential equations on evolving-in-time surfaces

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In our talk, we introduce the RBF-FD level set based method for the numerical solution of a reaction-diffusion-convection partial differential equation on an evolving-in-time surface. We present our work on obtaining the discrete counterpart of the governing equation by means of RBF-FD method and compare our numerical results against those obtained by analytical solutions. We investigate robustness of our schemes and estimate the computational efficiency. Instabilities arising due to convection terms, numerical solution of the linear systems that generate RBF-FD stencils, placement of discretization nodes and several other numerical challenges also concerned this study. Evolution of the surface $\Gamma(t)$ in normal and/or tangential directions is possible within our approach.