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**Yekaterina Epshteyn** and **Qing Xia\*** ([xia@math.utah.edu](mailto:xia@math.utah.edu)). *A Domain Decomposition Approach based on Difference Potentials Method for Chemotaxis Models in 3D.*

In this talk, I will present a domain decomposition approach based on Difference Potentials Method (DPM) for approximating the solution to the classical Patlak-Keller-Segel chemotaxis models in 3D. We employ DPM and uniform Cartesian meshes to handle sub-domains of complex geometric shapes, without loss of accuracy near the irregular boundaries of the sub-domains. As a result of using uniform meshes, fast Poisson solver based on FFT is employed for better efficiency of our numerical algorithms. In addition, our domain decomposition approach is capable of mesh adaptivity and is suitable for parallel computing, which further boosts the efficiency. Numerical results from 3D simulations will be given to demonstrate the significantly improved efficiency and similar accuracy of the domain decomposition approach, in comparison to the single domain approach. This is joint work with Y. Epshteyn. (Received September 24, 2018)