# Pattern Forming Reaction Diffusion Systems On Arbitrary Surfaces

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We develop and analyze two numerical methods to approximate solutions of reaction diffusion systems defined on arbitrary surfaces. In particular, we are interested in reaction diffusion systems that model pattern formation on evolving surfaces. Such systems have numerous applications; examples include patterns on seashells and tropical fish, tumor growth and cell membrane deformation. One of the two models we propose is based on *radially projected finite elements* [1], and the second method is based on the method introduced in [2]. The power of both of these numerical methods are that they are easy to implement, and all computations are done in logically rectangular coordinates.
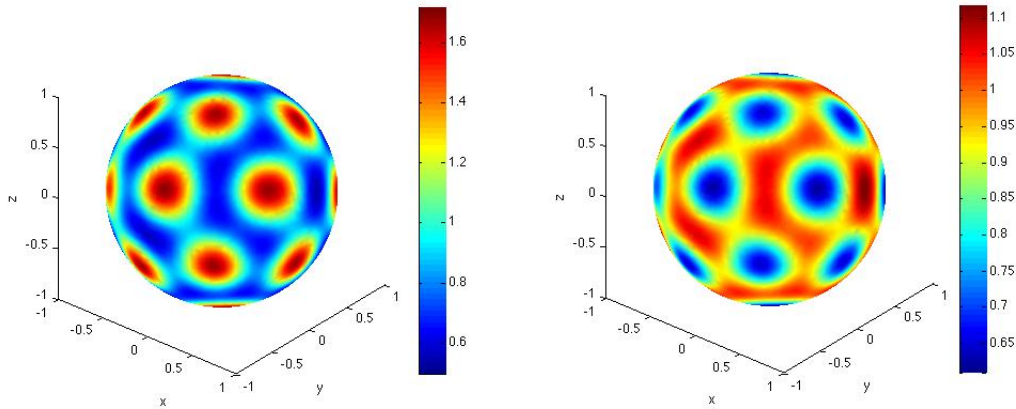
References

[1] Amnon J. Meir and Necibe Tuncer. Radially projected finite elements. *SIAM J. Sci. Comput.*, 31(3):2368–2385, 2009.

[2] Necibe Tuncer. Finite element method for arbitrary surfaces. *Submitted.*