

Meeting: 1004, Bowling Green, Kentucky, SS 5A, Special Session on Advances in the Study of Wavelets and Multi-wavelets

1004-42-151 **Qingtang Jiang***, Dept. of Math and Computer Sci., University of Missouri-St. Louis, St. Louis, MO 63121. *Nonhomogeneous Refinement Equations and Quadrilateral/Triangular Subdivision Schemes*. Preliminary report.

Nonhomogeneous (inhomogeneous) refinement equations generalized from their homogeneous counterpart are motivated by constructions of orthogonal multiwavelets and constructions of orthogonal wavelets on a finite interval. Some problems such as the existence, smoothness of the refinable functions, and the convergence of the cascade algorithms associated with the nonhomogeneous refinement equations have been studied by many researchers. On the other hand, for the surface design, one often wants to model certain regions with the quadrilateral nets and others with triangular nets to get better visual quality of the subdivision surfaces. In other words, it is desirable to have surfaces that have a hybrid quadrilateral/triangular net structure. In this talk, we will show how the quadrilateral/triangular subdivision schemes are related to the nonhomogeneous refinement equations, and therefore problems such as the smoothness analysis and the polynomial reproduction of the quadrilateral/triangular subdivision surfaces (near the regular vertices) can be transferred into the study of the smoothness and accuracy of the refinable functions associated with nonhomogeneous refinement equations. We will also discuss a few particular quadrilateral/triangular subdivision schemes. (Received January 23, 2005)