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Nonlinear stability of stationary solution for Surface Diffusion with triple junction

In the talk we will analyze the motion of a network of three curves in a ball having perpendicular intersection with the outer boundary and a common intersection at a triple junction with 120 degree angle conditions.
We assume that they move under Surface Diffusion Flow namely with a speed proportional to the negative Laplace-Beltrami of the curvature of the curves. It is a nonlinear fourth-order parabolic equation with nonlinear boundary conditions.
The flow decreases the total length of the curves and preserves the enclosed areas and in fact it has a H^{-1}-gradient flow structure.
We discuss the nonlinear stability of the stationary solution having the form of a Mercedes Benz star using the generalized principle of linearized stability.
We have shown that the stationary solution is normally stable and the linearized problem satisfied *Lopatinskii-Shapiro* and *normally ellipticity* condition which is needed for maximal regularity.
One of the difficulties which arises here is highly nonlocality in space due to the movement of triple junction. So in order to deal with this problem we use parabolic hölder settings.