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Existence of solutions for the diffusive VSC model.

The concept of a vesicle supply center (VSC), first proposed by Bartnicki-Garcia *et al* lies at the basis for a whole hierarchy of mathematical models which attempt to explain tip growth in fungal hyphae. It assumes that there is a point source in the tip which distributes cell wall material for the tip. Vesicles diffuse out from the VSC to the cell wall, producing growth of the cell wall orthogonal to the wall surface. This yields a geometric evolution equation for the surface of the hypha, in which the normal velocity of the surface is proportional to the flux of new material arriving at the cell wall and the inverse of the mean curvature. In this talk, we shall assume the VSC is given a fixed velocity, we will then show how to prove the existence of surfaces which stay stationary in a coordinate frame moving along with the supply center.