Existence for the α-patch model and the QG sharp front in Sobolev spaces

In this talk we will consider a family of contour dynamics equations depending on a parameter α with $0 < \alpha \leq 1$. The vortex patch problem of the 2-D Euler equation is obtained taking $\alpha \to 0$, and the case $\alpha = 1$ corresponds to a sharp front of the QG equation. We will show the main ingredients to prove local-in-time existence for the family of equations in Sobolev spaces.