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Solutions to the SQG front problems.

We consider a family of patch-like solutions of surface quasi-geostrophic (SQG) equation, where the patch may be unbounded. We derive the equations of the contour dynamics under different geometrical situations and prove that the initial value problems have unique local smooth solutions. Under a smallness assumption on the initial data, with the help of the dispersive estimate, we are able to prove the global existence of the solutions for SQG front problem. This is a joint work with John Hunter and Jingyang Shu. (Received August 21, 2019)