Equilibrium solutions of the Euler equations related to $m = 3$ symmetric vortex merger PAOLO LUZZATTO FEGIZ, CHARLES H.K. WILLIAMSON, Cornell University — Motivated by the merger of two corotating vortices, Cerretelli and Williamson (*J. Fluid Mech.* 2003) discovered a family of two-fold symmetric uniform vorticity patches. It was found that this branch of solutions passes through a transcritical bifurcation from the family of Kirchoff ellipses (discovered by Kamm 1987 and Saffman 1988), and that the branch continues up to a limiting $m = 2$ cat's eye shape, which corresponds with the $m > 2$ limiting patches of Wu, Overman and Zabusky (1984). We here extend the analysis to cover the case of three vorticity patches, obtaining a series of equilibria which extend the results of Dritschel (1985). We find that a change in the flow topology allows for solutions where the three patches meet. However, if one continues to uncover further equilibrium shapes, one finds a configuration whereby three "satellite" patches are joined to a central vorticity patch, whose size progressively increases, ultimately approaching the limiting shape for $m = 3$ found by Wu *et al.* (1984). The discussion will focus on topological changes and on the relation of these novel solutions to existing ones.

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