Contour surgery in multiply-connected domains RHODRI NEL-
SON, Kyoto University — In this talk we present a new method for computing the
motion of vortex patches in multiply connected domains. The method works by first
solving for the velocity field owing to an unbounded vortex at appropriate points
on the boundaries (as if the boundaries were not present). Following this, a suit-
able modified Schwarz-problem is solved to give a 'correction' velocity such that the
sum of this field and that due to the 'unbounded' vortex satisfy the no-normal flow
boundary condition on all boundaries present. For flows in which complex distribu-
tions of vorticity evolve, the algorithm performs contour surgery (allowing vortices
to split or merge) to allow accurate, long time integration of such systems.

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