Computation of the diffusion of a substance on an evolving surface

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We discuss modeling, analysis and numerics of the diffusion of a substance on a surface which is moving under some exterior law. For a time dependent surface (or curve) $\Gamma(t)$, $t \in [0, T]$, which moves with normal velocity and/or tangential velocity, the mass density is a solution to a partial differential equation on Γ. We derive adequate variational forms, discretize the problem with finite elements and prove convergence results for a Lagrangian approach.

This is joint work with C. M. Elliott (Sussex).