Flow over a Cavity
- Evolution of the Vortex Skeleton

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We consider a numerical simulation of a weakly compressible 2D flow over a cavity at Ma=0.38 (courtesy: M. Samimy). The flow over the cavity (yellow) is from left to right, the time is represented by the third dimension. Focus is placed on the temporal evolution of the vortices. These vortices (blue vortex cores) are identified as minima of the acceleration magnitude following the feature-extraction concept of finite-time topology (Kasten et al., 2011, in Pascucci et al., Springer). The spiraling curves represent fluid particle paths in the vortical regions. The volumetric smoke-like regions indicate a range of large acceleration magnitudes. The vortices originate at the leading edge and move through the cavity over the trailing edge. The halo of each vortex consists of spiraling particles with large acceleration values.