Spreading of Advected Tracers in a Creeping Flow in a Rectangular Channel MIRON KAUFMAN — We have developed an analytical solution [M.Kaufman, 2003 AIChE Annual Meeting Conference Proceedings] of the Navier-Stokes equation for the two-dimensional incompressible flow in a rectangular cavity in the limit of zero Reynolds number. An analytical solution for the fluid velocity along the axis of a parallelepiped, again in the Stokes limit, is also known. In this work we combine the two solutions to get analytically the three-dimensional creeping flow inside a channel in the shape of a parallelepiped. We integrate numerically the velocity vector to get trajectories of tracers advected by the fluid. We analyze the spreading in space of the tracers by calculating the time evolution of the entropy.

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