1033-76-42 **Thomas Hagen*** (thagen@memphis.edu), Department of Mathematical Sciences, The University of Memphis, Memphis, TN 38152. *Asymptotic analysis of viscoelastic sink flow in a wedge.* Preliminary report.

We discuss here the steady planar flow of a viscoelastic fluid in a converging channel with a line sink (wedge). For Newtonian fluids the solution is explicitly known as Jeffrey-Hamel flow. The viscoelastic fluids considered are given by constitutive equations in differential form and include the upper convected Maxwell fluid and the Oldroyd-B fluid. The governing equations typically consist of six coupled nonlinear partial differential equations of mixed type. In the absence of a rigorous mathematical theory for flows of this kind we present an asymptotic analysis to study the stress and velocity field near the apex of the wedge where the flow is highly singular. It will be shown that the elastic properties of the fluid dominate in thin boundary layers at the walls, while potential flow (at leading order) is recovered in a core region away from the walls. This work is done jointly with Jonathan D. Evans (University of Bath, UK). (Received August 22, 2007)