

On the stochastic equation for second grade fluids

P.A. Razafimandimby* and M. Sango

University of Pretoria

paulrazafi@gmail.com

SAMS Subject Classification: Probability Theory, Mathematical Statistics and Financial Mathematics

We investigate the stochastic equation for the motion of a second grade fluid filling a bounded domain of \mathbb{R}^2 . Global existence of a weak probabilistic solution (and weak in the sense of partial differential equations) is expounded. We are also able to prove the pathwise uniqueness of these solutions. The two results yield the unique existence of a strong probabilistic solution. On this basis we show that under suitable conditions on the data we can construct a sequence of solutions of the stochastic second grade fluid that converges to the probabilistic weak solution of the stochastic Navier-Stokes equations when the physical parameter α tends to zero.