1027-97-142 **Keith Mertens*** (mertens@math.colostate.edu), Department of Mathematics, Colorado State University, Fort Collins, CO 80521, and **Vakhtang Putkaradze**, **Peter Vorobieff** and **Bjorn Birnir**. *Meandering Streams.*

A stream of fluid flowing down a partially wetting inclined plane usually meanders, unless the volume flow rate is maintained at a highly constant value. However, fluctuations in the flow rate are inevitable in naturally occurring flows. Previous studies have conjectured that for some surfaces the meandering of a stream is an inherent instability. In this paper we show that on an acrylic plate we can eliminate the meandering by reducing perturbations entering the flow. By re-introducing controlled fluctuations, we show that they are indeed responsible for the onset of the meandering. We derive a theoretical model for the stream shape from first principles, which includes stream dynamics and forcing by external noise. While the deviation h(x), from a straight linear stream $h(x) = 0$, shows considerable variability as a function of downstream distance x, when an ensemble average is computed, averaging power spectrum S(k) as a function of wavenumber k for several different times t we obtain the power-law scaling $S(k) \sim k^{5/2}$. In addition, the growth of the area A(x) swept by the stream at the distance x grows as $A(x) \sim x^{1.75}$. These experimental results are in excellent agreement with our theory and recent results on turbulent flows in rivers and landsurface evolutions. (Received February 24, 2007)