Experimental determination of the von Kármán constant in turbulent two dimensional soap film flows[1] WALTER GOLDBURG, JASON LARKIN, ALISIA PRESCOTT, U. of Pittsburgh, HAMID KELLAY, Université Bordeaux, NICHOLAS GUTTENBERG, NIGEL GOLDENFELD, UIUC — We report measurements in both the viscous layer and in the log region of a two dimensional (2D) flowing soap film. The turbulence is created by a horizontal grid (a comb) and decays downstream where measurements are made. We report a sequence of measurements at film width Reynolds numbers of 10^4 -10^5, and fit our velocity profile data to a putative law of the wall form which is a reasonable representation of our data at the higher Reynolds numbers studied. We report our results for the von Kármán constant, and compare with calculations from theory and numerical simulation. Our findings indicate that the von Kármán constant in 2D is less than the accepted value in 3D.

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