Extracting Coherent Structures from Turbulence[1] GARY CHAN-
DLER, RICH KERSWELL, University of Bristol — We consider the problem of
extracting dynamically-important exact solutions of the Navier-Stokes equations di-
rectly from turbulent flows. By monitoring near-recurrences of the flow in direct
numerical simulations of 2D body-forced turbulence, we uncover an array of equilib-
rium points, travelling waves and periodic orbits over a range of Reynolds numbers,
which underpin the complicated dynamics seen. Progress will be discussed in deter-
mining whether these solutions can then be used to predict the mean statistics of
the turbulence (in the spirit of Kawahara & Kida 2001).

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